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THE SOCIETY FOR THE ADVANCEMENT OF MANAGEMENT JOURNAL

Reaching the First Agreement Under Collective Bargaining

The Challenge of Collective Bargaining to Industrial Training

The Use of Factory Inspection Statistics

Types of Foreman Training

Applied Scientific Management—Chapter XIII

The Purchase of New Machinery and Equipment

Engineering Societies Building
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SEPTEMBER, 1937 VOL. II, No. 5

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Comment

EVERYONE is supposed to like a good fight. But where you have delicate machinery, where you depend upon electric power, where masses of workers are gathered on the streets about a factory, in such cases a good fight may be fatal—fatal to property, to output and to human life itself.

A good fight may even be stimulating for a time. Adrenalin is released into the blood; heart action accelerates and we are "rarin' to go." Fighting may mobilize energy to remove obstacles formerly thought insurmountable. We glory in our "rights." We rationalize our desires as splendid principles to be defended.

But these are not the only results of a good fight. For fighting generates and establishes attitudes of opposition, conflict and even hatred, where the stakes involved are crucial.

People do not co-operate together satisfactorily or work well under supervisors if a fight is in the wind or has just been settled. They are restless, suspicious, touchy, defensive. It takes time to get the fight out of one's blood, and the longer the battle the slower the return to normalcy.

Industrial relations in 1937 are being thought of and handled by too many corporations as fighting issues. Federal legislation having cleared the way for organization among employes to gain momentum, membership and prestige, there are some employers who would still fight this trend. And there are also, be it frankly admitted, labor unions which rally new members and go after employers on a fight basis, with a fight vocabulary and attitude.

All of this fight psychology will not and cannot be rooted out as soon as peace is declared—on whatever basis it is reached. It takes months and even years for the resistances developed on both sides even in a brief labor conflict to get back to a point where confidence and a co-operative spirit prevail. Henry Dennison once said that employers should expect it to take a generation for workers to get over deep-rooted feelings of distrust after a period of inconsiderate handling.

The upshot of all this is that the fight approach to employes who are in process of organizing is a bad approach. It is uproductive in every sense. Make peace with thine adversary quickly, is an injunction not only of prudence but of profound economic and psychological strategy. In the politics of a democracy magnanimity is an indispensable asset if we are all to remain "bedfellows." But we are much more under

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Reaching the First Agreement Under Collective Bargaining[1]

By DON H. TAYLOR
Executive Vice President, New York Employing Printers Association, Inc.

THE printing industry is the third largest manufacturing industry in New York City, a fact often not appreciated because of the small size of its units. We have a unique set-up. Our trade association is called the New York Employing Printers Association. It has two autonomous groups, the Printers League (closed shop) and Master Printers (open shop), which deal with the labor problems of their respective members. On all matters other than those affecting labor, closed and open shops meet jointly.

It is important that both the employer and the union approach the first agreement with an open-minded and co-operative point of view. Although the union is at a disadvantage, being in the position of having to sell the idea, the employer has also a great deal to gain from a worthwhile arrangement. It is to the benefit of all concerned therefore that each group realize its strong and weak points.

Since 1906 the Printers League has been the collective bargaining agency for the employers in the City which recognize the unions. Since that date there has been only one major break in the industry and even in that situation the issue was complicated by the fact that it included a dispute between the international union and the local union. Thus we have had a wealth of experience in operating under an agreement. During the past years, of course, there have been a few instances also where we faced the problem of entering negotiations with unions we had not dealt with before and coming to an initial agreement.

Reasoning Versus Force

The union in negotiating a first contract is in the position of a seller attempting to convince the employer of the desirability of contracting or dealing with it. I do not know, from my own experience, of any instance where the union has been able to sell itself without in the background making use in some way of the element of force. Perhaps we will enter an era when employers will feel that dealing with organized labor is a desirable procedure in itself, but I do not think we have reached that point yet. Even today employers call unions in to deal with them because they probably fear something worse.

This factor of fear may be a completely outside one. It may be the fear of loss of customers, which is very effectively used by the unions in the printing industry, where they "sell" the principal customers the use of the union label on all printing. Of course, the threat of strike always is lingering in the background.

The approach to the conference today between employer and the union is different from what it has been in the past. The Wagner Act permits the unions to write a courteous letter which starts off by saying that, whether the employer may know it or not, a majority of his employes are members of the union organization, that they are, therefore, entitled to a conference and would like to meet the employer as of such and such a date. In that case, the factor of force would be what is going to happen as of that date.

The world is full of amateur or volunteer arbitrators or negotiators. An employer need but get into a difficult situation and he will be amazed by the number of outside individuals and groups who are willing to take an interest in his problems and help him out of the situation. The usual answer of these people is, "Gentlemen, just sit down and talk to these people and see what happens." That is an easy suggestion, but practically, from the employer's standpoint, the issue at stake may be just that.

Such a situation was illustrated in our industry a little over a year ago. In one of the plants an outside group organized the proof and errand boys, pulled a strike

[1] Adapted from an address made by Mr. Taylor in a series of conferences on "Collective Bargaining Today and Tomorrow" held under the auspices of the Bureau of Personnel Administration, and to be included in a book of the same title, this article is reprinted here through the courtesy of Dr. Henry C. Metcalf.

without notice or warning, and then besieged the employers with requests to talk things over with them. Actually, the problem involved a jurisdictional dispute with three other unions, and we know that this new element was undesirable in the industry. Of course labor's answer to that is, "Who are you to judge who is and who is not desirable," but in this case our judgment was backed by the unions themselves. This new independent group was not affiliated with any other group, and we have always dealt only with unions with international affiliations.

In that situation the labor board put the pressure on us to start a first conference. We explained the peculiar situation and no conference was held. But, assuming that there is no real reason why the two parties should not sit down, the initial conference concerns itself, as far as the employer is concerned, with the overcoming of certain ingrained attitudes resulting from management's past position toward collective bargaining, the habits of individualism in American business leaders, and built up animosities because of New Deal legislation.

There are certain employers in business today who find it practically impossible to sit down with outside labor representatives of the employes and reach an agreement. These men are the product of the old school of paternalistic management. I have a great deal of sympathy with some of these men who sincerely have operated their businesses in a manner they thought to the best interest of their employes and now honestly cannot understand why their employes are dissatisfied with conditions. But this type of American business leader in American business management is being forced out by new conditions.

Frankly, I have not a great deal of confidence in outside agencies. The Wagner Act may be a means of bringing employers and employes together. But, even where it is impartial, any agreement that is going to have any real merit will have to be worked out by the parties concerned and must be built on a degree of understanding and confidence on both sides.

Lack of confidence and understanding is perhaps the chief difficulty today in many situations. The mushroom union inspires confidence in no one. In our industry the unions have a background of many years of experience, and, once the employer is over the hurdle of the "shall I deal with the union" debate, both sides can sit down confident that agreements will be lived up to and carried through. With new unions, no one can tell what is going to happen. Employers and the union are both at sea; the net result is that both sides distrust each other, and much time is wasted in overcoming this attitude.

The union's selling points, it seems to me, in approaching the employer are primarily two, and both points should be basic to any contract or agreement reached.

The first factor is competition. One of the union's strong selling points and one of the strong arguments which have led employers to form collective bargaining agreements has been the fact that wages and hours will be eliminated from competition and that as a result of the agreement employers know that these conditions will be uniform. Consequently, managerial efficiency will be the major factor in the competitive picture. Theoretically, this is a good argument and was the primary factor which led our group to get together in 1906. Unfortunately, in practice, competition is not bound by the limits of local agreements but is nationwide.

The second factor is security. If you can deal with a substantial, well-established union which has an orderly procedure, a well set-up constitution, and a long-tested experience, it may be the best haven in the world for employers today who fear that an independent organization may come in and take hold of their employes. I am not going into the C. I. O.—A. F. of L. dispute, which has been presented by earlier speakers; but the question is involved in the point I am making.

Negotiation of the Contract

Employers, because of the competitive situation, will very often offer the excuse in its simplest form—"Why pick on me? I am perfectly willing to sign an agreement, if my competitors will too."

Cost of living figures are often discussed in negotiations, but are usually emphasized only by the side which finds them of value to its argument. The history of our negotiations illustrates that point. Only once did our contract contain a clause that wages should bear a direct relation to the cost of living. After that contract went into effect we had the depression of 1920. The contract clearly stated that wages should be adjusted in accordance with the cost of living. But the union did not want to go along. Finally, an arbitrator gave the union a six-dollar reduction in wages on the basis of the cost of living, and the cost of living clause has never appeared in a contract since.

In any business conference, each side makes use of

the facts and figures that bear most nearly on its particular case and soft-pedals the facts and figures which may not look to its advantage. The typical labor union conference, however, is quite a different conference from the company union techniques, I believe. First, you are dealing with a group of men who have something at stake—their jobs—and they have to go back to their organizations with agreements that will be satisfactory to the majority of their membership and will in turn result in their re-election. On the other hand, if you have an autocratic union where the leader does not worry about his election and what his membership thinks, the leader may be more amenable to suggestions from the employers for the good of the industry. But this situation is likely to lead to racketeering.

The first conference is the time for the employer to get as much as he can. At that time the union is in a selling position even though the men may be out of the plants and sitting on the side-walks, and you want them back badly. The union is still trying to sell a bill of goods. Once the union gets a contract it is a cumulative affair, and the union is always trying to improve its conditions. The employer must drive as equitable a bargain as he can at this first meeting, and he should remember that it means something for the union to get him into line.

Object and Content of Signed Agreements

The contracts in our own industry, perhaps, could be used as a good illustration of employer-union contracts. Admittedly, they are by no means ideal. They were arrived at by a process of trial and error; and, if you submitted them to a lawyer, he would immediately tell you how bad they are. He would say that they are ambiguous, subject to a lot of disputes, and that the employer is not properly protected; and he would be right. On the other hand, nearly every paragraph was arrived at only after long hours of debate and final compromise. If, after hours of weary debate, we had submitted them to a lawyer, we would have had to start all over again.

All collective bargaining, and particularly the wording of a final contract, is a matter of give and take. In the case of new unions, you will find both groups worried about just what is being said. A great deal of time is spent in the exact wording of clauses to meet every situation, which cannot be done. More important than anything else is that the agreement be made with an organization in which you have confidence. The administration is the important thing, and that depends on the parties, not on the contract. No lawyer can write a contract without any loopholes.

In the document there are always provisions for wages, shop practices, responsibilities of employes, responsibilities of employers, and two clauses mentioned before—that conditions granted this employer are the same or better than those granted his competitors, and provisions for the maintenance of operations while the disputes and arbitration of disputes are going on. Theoretically, all unions are opposed to compulsory arbitration, but do favor voluntary arbitration. In practice we have developed a procedure that all contracts continue in force until a new contract is negotiated or notice served by either party. Of course there is an advantage and disadvantage to both sides in this arrangement. During the depression it was difficult to get the unions to enter a new agreement, and, with the market going up, it is just as difficult to get employers to act rapidly in negotiating agreements. Both sides must use various devices to force the issue.

Some contracts have provisions for notification in advance of strike, lockout or modification of agreement, but we have no such clauses in our contracts. Our contract provides that there shall be no strikes or lockouts during the term of the contract. Our unions are well established, and their procedure in case of strike is well established. Before our unions go on strike they have a definite procedure which includes getting the sanction of the international unions. The international unions cannot grant this sanction until they have taken certain other steps provided in their constitution. They must discuss the matter with the employer, thereby automatically giving notice.

Aids in Reaching Agreement

The problem of getting agreement to abide by the facts is one of the most difficult in dealing with any group of men. One situation which is of vital concern to us illustrates what is actually happening in industry and how difficult it is to deal with the average union. In the printing industry there are three craft unions in the press rooms—the Pressmen's Union, the Press Assistants' Union and the Paper Handlers' Union. This structure was built up in the days of hand-fed machines. As a result of changing equipment and machinery, the number of feeders or press assistants required has changed, but being a separate union with many jobs at stake it has been impossible to get these men to sit down to any calm analysis of the facts of the

situation and reach an agreement based on those facts. Of course, there are exceptions, and Mr. Francis Goodell has been notably successful in one instance in getting agreement to abide by the facts.

Five or six years ago we built up a five-year plan for the printing industry, which included a program to affiliate the press assistants into the Paper Handlers' and Pressmen's unions. We felt it was an ideal arrangement; but, from the point of view of strategy, it was very bad, as the feeders saw in the plan their complete elimination. The fact is that if the unions were reduced from three to one, the number of men employed would probably not be reduced. The improved machinery calls for greater skill on the part of the pressman, and we would have one man to each man instead of to two machines. But this union feels that it is fighting for its life, and all the facts in the world mean nothing in such circumstances.

In all such cases the union will be willing to go along only where it has nothing to lose. In our situation, the union feels it has everything to lose and nothing to gain. We have finally managed to get a commission set up on which employers and unions are jointly represented to study the situation, and from the impartial study to negotiate an agreement.

We have heard a great deal about the workers' property right in a job, but here we have a situation where jobs for certain men would actually disappear. Men beyond a certain age limit would find it difficult to transfer to another job classification. In this connection, throughout the depression our association has run a school, in co-operation with the Board of Education, which contains all the latest types of equipment and makes it possible for unemployed journeymen to learn to operate all the new machinery, and they are thus saved for the industry.

As is the case in many other industries, we have a shortage of trained men for certain kinds of equipment, and, without our school, we would have been strapped. Outside of New York, employers are clamoring for help, and there are two to five hundred unemployables in each of the unions. These men are sent out occasionally, but the employers complain and back they come.

I attribute whatever success the printing industry has had in collective bargaining locally to the fact that we have not limited our contacts with union representatives to matters of bargaining. We have our regular apprentice schools and other opportunities to get together without having always to discuss controversial subjects, with the result that we have built up a certain degree of confidence and friendship; and when we do come together for serious discussion on wages and hours, although the debates may be very heated, we leave still friends. I think it is not only our collective bargaining set-up but these supplementary activities which have made our procedure so successful.

One of the chief difficulties of democratic unions is the fact that parties in power are thrown out and new ones come in. It is a long slow job of education to get union leaders to look at the problems from the point of view of the industry. When they acquire this experience, they are frequently superior in understanding to employers. But when you go into a conference with a group of new men, you have to spend a long period to educate them to see the problems of the industry as a whole—apart from their experience in individual shops.

When an agreement cannot be reached on certain issues and it is mutually agreed to submit these issues to arbitration, great care should be taken in setting up the arbitration procedure to make sure that the arbitrator himself does not further confound the situation. First of all, there should be an agreed statement of facts and the issues to be submitted to arbitration which, jointly signed by both parties, prescribes the limits beyond which the arbitrator should not go. Second, care should be taken that the arbitrator not only is fair and unbiased but, if possible, should have had some experience in arbitration. Too many arbitrators misconceive their function or go beyond the limits of the issues they are supposed to settle.

As far as possible, retroactive provisions with respect to wages should be avoided. They present many administrative plant difficulties and, of course, force the employer to absorb increased costs, since customers cannot be required on work already finished to go along on a retroactive price increase. In some cases employers and unions agree that an arbitrator's decision on wages shall be effective as of the date the award of the arbitrator is signed. This is not as serious as a retroactive decision since the employer at least has a warning that a wage change may be effective as of a particular date.

In conclusion I should like to emphasize again that the main stumbling block to reaching a satisfactory first agreement is the psychological attitude of the representatives of the two groups engaged in the conference. If the employer feels that collective bargaining is being forced down his throat against his will, it is difficult for

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The Challenge of Collective Bargaining to Industrial Training[1]

By JAMES H. GREENE
Executive Vice President, Chamber of Commerce, Pittsburgh, Pa.

Unless collective bargaining is conducted under conditions of mutual confidence with full knowledge of conditions affecting all parties it cannot be entirely successful. This is the challenge to management, labor unions and educational institutions: to train leaders to meet the bargaining situation intelligently and effectively.

Historical Background

WHEN commercial and industrial institutions were small affairs in which the actual owner or owners were operating managers, relations between salary and wage earners and management were on an individual and personal basis. There were doubtless cases of injustice and perhaps even of sabotage but they were settled, on the whole, before they became matters of public interest. With the rise of the American Federation of Labor certain classes of skilled labor, such as the building trades, transportation groups and miners became highly unionized, but the mass of semi-skilled and unskilled workers were untouched by the trade union movement.

With the rise of large corporations with factories and offices distributed throughout the country, many with units employing upwards of ten thousand persons, labor difficulties developed owing to corporate ownership and the consequent absence or lack of uniformity in the administration of labor policies. Intelligent management leaders some years ago worked out and instituted plans for employe representation whereby the grievances of workers could be brought to the attention of management in a consistent and orderly fashion. At the other extreme, a large number of corporations gave lip service to an avowed policy of the open door policy of dealing with individual complaints. This sounded well in theory but was a failure in practice. Actually it was a mental and an economic hazard for the average factory worker to leave his work place in greasy overalls and get into a richly carpeted office. When he had run all of these mental risks, he was more often than not told that the matter would be looked into and that was the last he heard of it. Practically, the "big boss" may have heard through a long line of managers, superintendents and foremen that the employe in question was a trouble-maker.

In many cases, forward-looking companies established personnel or industrial relations departments and attempted more or less successfully to know what was going on, prevent complaints by maintaining working condition standards and preserve the personal relationship between workers and some one who actually represented management and could speak with authority. Where corporate management was honest and gave full authority to its personnel representatives, there was little trouble. Where such was not the case and there was the proverbial "buck-passing," trouble developed. Conditions of industrial unrest were ripe for the N.R.A., the famous 7-A clause and the Wagner Labor Relations Act which followed in rapid succession. During this period, labor leaders were not inactive. The more conservative tactics of the A. F. of L., established by Samuel Gompers and carried on by William Green, aroused impatience among a coterie of laborites, the leader of which was John L. Lewis. The launching of the C. I. O. was followed by organization work on the part of some capable leaders who saw in the labor movement a golden opportunity. Like many similar movements, worthy as to cause, it got out of hand in some cases. Interlopers appeared; intimidation long practiced by the employer side was adopted by the strikers. And then came the "sit-down" strike, an open defiance of the principle of property rights. Strikes assumed such proportions that they threatened public welfare. A sit-down strike in several General Motors plants not only tied up that colosssal manufacturing organization but paralyzed

[1] Reprinted by permission from the forthcoming revised edition of "Organized Training in Business," by James H. Greene, Harper & Brothers, 1937.

business generally in many towns and curtailed iron and steel production in large cities far removed from the actual scene of trouble. The matter was no longer of concern to a group of stockholders; it was a matter of national and public concern.

It is a fact well known to economists that in a period of business recession, wages do not fall as rapidly as prices, but on the other hand during a recovery period wages do not rise as rapidly as the cost of living.[2] Therefore the rise in the business curve is usually accompanied by strikes and labor disturbances.

Organized labor maintains that collective bargaining with one of its divisions as the sole labor bargaining agent is the only solution. Many employers argue that they cannot safely entrust their economic welfare to a powerful organization with many untrained and uncontrolled leaders. The part of government in any controversy, properly or not, has a political tinge. The question of the rights of minorites is likewise a controversial point. Labor, on the one hand, and with some semblance of logic on its side, contends that there is only *one* practical method of representing labor interests and that is by vesting authority for the entire group in the hands of the majority. Management, on the other hand, calls attention to well authenticated cases where a militant minority through intimidation has become a majority.

The facts, stripped of their controversial elements, are that three parties have common interests—the workers, the management and the general public. In view of this, some friendly and non-harmful method of solution must be found. Purchasing power and operating capital must not be depleted through long drawn out, bitter struggles.

The matter is given space in this book because, after personalities and other extraneous matters are eliminated, collective bargaining becomes essentially a training process with perhaps broader educational implications involving the general public. Labor, capital and management have a right to a fair share of the proceeds of an industrial, commercial or service enterprise, and the general public has also a right to the lowest price for such product or service, consistent with the rights of the other two parties. To these three might be added a third factor, government, which should be interested in seeing that taxes are not too high; that legislation does not interfere with the free flow of commerce and trade, thereby hindering the flow of taxes, and that the rights of workers are protected. This is a complicated human mechanism, and any undue advantage of one group disturbs the delicate adjustment and sets in motion a train of social and economic ills which seriously disturb the public welfare. It must be freely admitted that while the comprehensive partnership here pictured has been given mere lip service, except in the case of a few outstanding industrial statesmen, labor leaders and public officials, it is nevertheless a realistic and not an idealistic one. The public welfare is dependent in no small way upon success or failure in solving this problem.

[2] According to Bureau of Labor Statistics this did not occur in 1935-1936.

True Collective Bargaining

It is not within the province of this book to discuss the social and economic aspects of collective bargaining or the merits of the controversy which surrounds its present use in business. As a training tool in accomplishing the broad social and economic ends of business it should assume a growing importance as the points at issue one by one become settled.

While the rest of the training technique described in this book presupposes initiative if not control by management, there is nothing inherent in training which necessitates such control by management. And this must necessarily be the case with collective bargaining.

The end of real collective bargaining must be the resolution of a controversial situation involving management and employes into an agreement which is mutually satisfactory.

A Collective Bargaining Situation

The following factors must be recognized at the outset as being involved in a real collective bargaining situation:

1. An organization which permits employes to voice their requests in an intelligent, independent and effective way.

2. A sympathetic, intelligent, tactful and authoritative management organization which can and will give prompt attention to such employe requests and courageously work for a solution which is socially and economically sound.

3. Some tribunal which will assist management and employes in arbitrating difficulties. As the collective bargaining movement grows, and management and employe groups become better trained, there should be less and less recourse to such procedure.

4. Research and fact-collecting facilities for providing both groups with accurate and pertinent data for use in their deliberations.

5. Mutual confidence and respect of both groups, one for the other.

6. An impartial, trained chairman who enjoys the confidence and respect of both groups. He may be a member of either group.

7. A secretary or parliamentary adviser who can help to guide the discussions and assist in the marshalling of necessary data.

Given a situation such as has been outlined above, there is no doubt that the ends to be gained in collective bargaining may be attained. This has been demonstrated in a number of instances, such as the needle work trades in New York, the men's clothing trades in Chicago, and the coal operators and United Mine Workers.

Failure to realize such a situation at the outset should not be considered an out and out failure. With proper training facilities at the hands of a skilled trainer, any situation can be improved and progress made toward the goal which has been set up. From the very nature of the subject matter to be handled, such a person must be impartial and hence anyone on the payroll of a corporation may be under suspicion. Organized labor may contend that it alone should and will undertake the training of its workers and the necessary research to obtain the facts for their use. Such a situation is not impossible and may attain the same ends. On the other hand, since collective bargaining is to be a co-operative affair between management and employes, it would seem advantageous to both parties to do their work together rather than to come together only for debates.

Collective Bargaining at Work

Usually one or more individuals are selected by a group of employes to represent them in their negotiations with management and these individuals meet with the works manager or some other executive and present their demands. Such demands usually deal with matters of hours, wages or method of payment, working conditions, and, latterly, union recognition.

Each side usually tries to obtain the best bargain possible regardless of the merits of the case. The current strength or weakness of the respective sides usually decides the matter. Obviously there is no training involved in such a situation except, perhaps, in the matter of "sharp practice."

The Ideal Collective Bargaining Situation

Assuming that both groups, employes and management, want to be fair, it would seem possible to set up an ideal procedure which should be approached, if not followed, no matter what the complexion of the organization which represents the employes might be. This might be outlined as follows:

1. A clear definition of the matters which are proper for collective bargaining should be established, although this provision should be flexible enough so that unforeseen but genuine issues which arise later may be jointly considered. It is assumed that the management has certain clearly defined duties and responsibilities to stockholders as well as to employes. This does not mean that it may not be questioned as to its policies, and most forward-looking companies keep nothing back. When mutually agreed upon, after full discussion, this should prevent misunderstandings and friction.

2. A plan should be agreed upon whereby the employes are properly represented by representatives of their own choosing in a manner which they may elect.

3. There should be a satisfactory plan for arbitration in event that the employes and management representatives are unable to agree.

4. Grievances and complaints from individuals and groups, which have not been satisfactorily adjusted by management, should come before this joint committee.

5. The joint committee should be permitted to call before it any executive, supervisor or employe to obtain information within the scope which has been agreed upon in 1. Anything outside of this scope may be furnished by the management, if it so desires.

6. Employe representatives may take whatever reasonable means seem necessary to learn the desires of their constitutency.

7. The work of collective bargaining agents should not interfere with regular production work.

The Scope of Collective Bargaining

Theoretically, employes have a right to bargain collectively regarding those matters which concern their welfare, such as wages, hours, overtime, speed of work and general working conditions. In many cases representatives of management have expressed their opposition to collective bargaining because of the possibility of employes attempting to control matters which properly are the sole concern of management. Practically, this fear does not seem to be borne out by the experiences of those industries which deal with organized

labor and where collective bargaining has been conducted over a period of years.

In the Appalachian Agreement between eastern and some mid-western bituminous coal operators and certain districts of the United Mine Workers of America this ideal seems to be attained. This agreement contains the following clause: [3]

> The management of the mine, the direction of the working force, and the right to hire and discharge are vested exclusively in the Operator, and the United Mine Workers of America shall not abridge these rights. It is not the intention of this provision to encourage the discharge of Mine Workers, or the refusal of employment to applicants because of personal prejudice or activity in matters affecting the United Mine Workers of America.

This clearly differentiates between those matters which are solely the responsibility of management and those which may properly be matters for joint consideration with workers.

To handle grievances a Mine Committee is set up in the following paragraph: [4]

> A committee of three (3) Mine Workers who shall be able to speak and understand the English language, shall be elected at each mine by the Mine Workers employed at such mine. Each member of the Mine Committee shall be an employee of the mine at which he is a committee member, and shall be eligible to serve as a committee member only so long as he continues to be an employee of said mine. The duties of the Mine Committee shall be confined to the adjustment of disputes arising out of this Agreement that the mine management and Mine Worker, or Mine Workers, have failed to adjust. The Mine Committee shall have no other authority or exercise any other control, nor in any way interfere with the operation of the mine; for violation of this clause any or all members of the Committee may be removed from the Committee.

It will be noted that the Operator is protected from untoward acts of this Committee.

Where such grievances cannot be satisfactorily adjusted by the Mine Committee, the settlement of disputes is provided for in the following paragraphs: [5]

> Should differences arise between the Mine Workers and the Operator as to the meaning and application of the provisions of this Agreement, or should differences arise about matters not specifically mentioned in this Agreement, or should any local trouble of any kind arise at any mine, there shall be no suspension of work on account of such differences, but an earnest effort shall be made to settle such differences immediately:
>
> First. Between the aggrieved party and the mine management;
>
> Second. Through the management of the mine and the Mine Committee;
>
> Third. By a Board consisting of four members, two of whom shall be designated by the Mine Workers and two by the Operators.
>
> Should the Board fail to agree, the matter shall be referred to an umpire selected by said Board. Should the Board be unable to agree on the selection of an umpire, he shall be designated by the International President of the United Mine Workers of America and the President of the Operators' Association affected. The decision of the umpire in any event shall be final.
>
> District conferences may establish an intermediate board consisting of two (2) commissioners, one representing the Operators and one representing the Mine Workers with such powers as said conference may delegate.
>
> Pending the hearing of disputes, the Mine Workers shall not cease work because of any dispute; and a decision reached at any stage of the proceedings shall be binding on both parties thereto, and shall not be subject to reopening by any other party or branch of either association except by mutual agreement.
>
> Expense and salary incident to the services of an umpire shall be paid jointly by the Operators and Mine Workers in each district.
>
> When a Mine Worker has been discharged from his employment and he believes he has been unjustly dealt with, it shall be a case arising under the method of settling disputes herein provided. In all discharge cases should it be decided under the rules of this Agreement that an injustice has been dealt the Mine Worker, the Operator shall reinstate and compensate him at the rate based on the earnings of said Mine Worker prior to such discharge. Provided, however, that such case shall be taken up and disposed of within five days from the date of discharge.

The "sit-down" or any other type of strike is outlawed by the following provision: [6]

> A strike or stoppage of work on the part of the Mine Workers shall be a violation of this Agreement. The concerted action by any Mine Workers intended for the purpose of, or resulting in a substantial curtailment of the normal output of a mine, or any portion thereof, shall be considered as an illegal strike, and the offending Mine Workers shall be subject to the Penalty clause contained in this Agreement. In the event that a Board of four members, such as is provided for under the "Settlement of Disputes" clause contained in this Agreement, finds that any Mine Worker or Mine Workers have been responsible for an illegal suspension of work, such Mine Worker or Mine Workers shall be discharged or otherwise disciplined in accordance with the decision of such Board, or with the decision of an umpire selected as provided in the "Settlement of Disputes" clause if such Board is unable to agree. Under no circumstances shall the Operator discuss the matter under dispute with the Mine Committee or any representative of the United Mine Workers of America during suspension of work in violation of this Agreement.

The rights of both management and workers as regards cost of production and earnings are protected in the following paragraph: [7]

[3] Paragraph 27, Appalachian Agreement, Effective Oct. 1, 1935.
[4] Paragraph 28, Appalachian Agreement, Effective Oct. 1, 1935.
[5] Paragraphs 29-34, Appalachian Agreement, Effective Oct. 1, 1935.
[6] Districts 3, 4 and 5 Agreement, Paragraph 57, U. M. W. of A.
[7] Districts 3, 4 and 5 Agreement, Paragraph 90, U. M. W. of A.

All internal differences are hereby referred to the various districts for settlement, with the understanding that only by mutual consent shall anything be done in district conferences that will increase the cost of production or decrease the earning capacity of the men.

While lengthy and bloody labor disputes have waged in certain coal fields, those covered by this agreement have operated continuously and peacefully for a considerable period. This speaks volumes for the success of collective bargaining in this instance.

The Extent of Collective Bargaining

While no accurate figures are available of the extent of collective bargaining, it is fair to assume that the gains made by the C. I. O. and A. F. of L. early in 1937 as well as the growth of company unions, or employe representation plans, have covered a large part of the commercial and industrial organizations of the country. This growth has occurred quite recently. An analysis [8] of 14,725 reporting establishments with employer-employe dealing showed that 11,267, or 76.5 per cent, of the establishments deal with their employes on an individual basis only; 2,866, or 19.5 per cent, deal with some or all of their employes through trade unions but have no company unions; 96, or 0.6 per cent, deal through both trade unions and company unions; and 496, or 3.4 per cent, through a company union alone.

These figures present a somewhat different picture from conditions in the steel industry as they existed in 1934, for Daugherty, in discussing that year's situation writes:

> The number of workers in plants operating under employee-representation plans at the end of 1934 was probably between 90 and 95 per cent of the total number of plant workers in the dustry. [9] This statement does not mean, of course, that this proportion of the iron- and steel-workers supported the plans or participated more or less actively in them. It does mean that employee-representation procedure was available to them for grievance settlement if they wanted it. In other words, whereas before the Code period almost 80 per cent of the workers had nothing but individual grievance settlement arrangements, it is doubtful if under the Code more than 4 or 5 per cent of all the plant workers were under the old-fashioned system of "individual bargaining." [10]

[8] Monthly Labor Review, U. S. Department of Labor.

[9] Daugherty, De Chazeau and Stratton, The Economics of the Iron and Steel Industry, Volume II, p. 1007.

[10] This statement must not be understood to mean that 95 per cent of the plant workers were in plants having "collective bargaining," as that term is defined in these pages. The statement does mean that, under the Code, 95 per cent of the workers had some formal channel for grievance settlement. It should be remembered also that although outside unions had formal recognition, under the Code, in plants employing only 2 or 3 per cent of iron- and steel-workers, there were union locals in many of the plants having company union plans, and among these plants a majority agreed to meet informally with union mill committees for grievance settlement.

The Future of Collective Bargaining

The rapid growth of trade and especially industrial unions, due to economic, social and political conditions has produced a shortage of trained and competent leaders. This has resulted in some cases in labor racketeering and the rise of some unscrupulous leaders. When this condition is corrected, sound and effective collective bargaining may be expected to result. Liberal leaders, particularly in England, have become more conservative when given responsibility. This is beginning to happen in the United States. As has been stated, true collective bargaining can be made to render a real service to management and employes and to the general public as well. Its place in a democracy is unquestioned.

During this period of development, the field of training has a real contribution to make. Ignorance of economic conditions on the part of leaders among employes and a failure on the part of management to recognize a new social and economic order leads to industrial strife. The Appalachian Agreement specifies that Mine Committees must be composed of workers who can read and write the English language. This is a most elementary requirement. Workers, today, must know a great deal more if they are not to be inveigled into demands which are not in their own interest or be misled by unscrupulous politicians or short-sighted management representatives. There has been much "propagandizing" of employes for the purpose of giving them an elementary knowledge of economics. Some of this has been good; some has had a distinct political flavor. In some cases employes are distinctly suspicious of the authenticity of this type of material.

There is need for a sound approach to this problem. It must rest upon a feeling of confidence in management and its representatives. Upon such a foundation can be built a general educational program, designed to make employes more intelligent about the place their work and their earnings occupy in the company picture and the relationships of their company to general industrial and commercial conditions.

The building of such an educational program cannot be standardized as to its content. A careful study of the personnel of the organization as regards its general educational level must be studied and charted. Materials and methods must be carefully considered. The assistance of public school systems and colleges and universities through residence or extension teaching

may be obtained. Reputable correspondence schools may be able to supply courses and books and even aid in other ways. Discussion groups, clubs and other devices to stimulate study through discussion should be utilized. Public speaking, training in the analysis of working situations, in reading financial statements, interpretations of business curves and statistics on the cost of living are all elements in developing a group of employes who can be made allies instead of enemies of the company.

Today most companies with a widely distributed list of stockholders prepare periodic reports so designed as to be readily intelligible to the reader. These should be utilized to keep workers informed of the financial status of the company. Such reports should be supplemented with additional data on current production and expense. By these means workers will know the truth concerning the financial status of the company, and may be able to judge more intelligently the reasonableness of current wage rates.

The picture as drawn is by no means Utopian and many companies are now pursuing such a co-operative course with their employes. It is not inconceivable that in the immediate future employes through their organizations, whether they be industrial, trades or company unions, will co-operate with management in the organization and administration of a broad training program designed to help employes first and stockholders and management second in making the plant, shop or store a more interesting as well as more profitable place in which to work. This is a goal toward which any corporation president might properly direct a training program.

Summary

1. Failure to provide for proper labor relations has given an impetus to the labor movement.

2. The matter of proper labor relations is one of vital concern to employes, employers, the general public and government.

3. Collective bargaining may become a valuable training tool in accomplishing the broad social and economic ends of business.

4. Unless collective bargaining is conducted under conditions of mutual confidence with full knowledge of conditions affecting all parties it cannot be entirely successful.

5. Difficulties, obstacles and preliminary failures should not prevent repeated efforts to improve collective bargaining.

6. The respective rights of employer and employe must be carefully set forth as a preliminary to any collective bargaining.

7. Mutual protection from untoward acts by either party must be provided if negotiations are to proceed satisfactorily.

8. Provision should be made for voluntary arbitration when there is continued lack of agreement.

9. Collective bargaining is more than a passing phase of management problems.

10. It affords an opportunity for co-operative training in the fundamental facts of a business.

Annual Conference Announcement
See back cover!

Reaching the First Agreement Under Collective Bargaining
(Continued from page 133)

him to be in a frame of mind where he can intelligently and effectively negotiate. On the other hand, where the labor representatives have achieved the right to sit at the conference table through direct action and after years of what they regard as suppression and oppression they, too, are in a frame of mind which makes them difficult to deal with. Once embarked on collective bargaining, therefore, employer representatives will achieve the best results if they can enter the conference room in the same spirit and frame of mind as they would enter any other business deal. Once the decision to deal with a union is made, enter into negotiations whole-heartedly. In large measure the attitude and approach of the union representatives will be determined by the approach and attitude of the employer's representatives.

The Use of Factory Inspection Statistics[1]

By C. M. ARMSTRONG

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The function of the factory is to produce material in accordance with the specifications. If the instructions for manufacture of a particular part could be complete and exact in every detail and if they could be exactly followed, every piece produced would be exactly like every other piece. If one day's production were satisfactory, every day's production would be. This is the ideal. But in actual practice many variations occur which result in changes in the product.

Chance and Controllable Variations

ALMOST every factory executive has faced epidemics of poor workmanship, days when everything went wrong.

These changes are the result of two types of causes: chance variations or controllable variations.

Every machine has its limit of accuracy. Bearings have some play in them; shafts, punches, etc., can bend slightly; loose bearings permit slight movements of the shafts. On one turn the shaft may be against one side of the bearing and on the next turn against the other side. The bending of shafts and punches will result in variation in the working position of the various parts of machines. As these changes occur in the producing machine, the items produced will vary slightly in their size, shape or quality.

Similarly the operators have their limits of accuracy. A particular person has limits of ability. The human eye does not recognize minute differences. The hand cannot repeat motions exactly. On one trial a slight error from normal in one direction may occur. On the next the error may be in the opposite direction.

Such variations in men and machines as we have just outlined are "uncontrollable" in the sense that the machine as designed, or the operator with his present training cannot do better. Every machine part and every operator is working to the limit of accuracy. What happens within these limits of accuracy or tolerance is pure chance. Most people can visualize this situation best by thinking of a man shooting at a target. The marksman will take the same care in shooting each time but the bullet will not hit exactly the same spot. There will be one spot that will be most frequently hit and around that will be scattered shots, distributed at random by the chance factors involved in the man and the gun. No shots will fall outside a certain distance from the bull's-eye. The outside limit of the least accurate shots indicates the limit of accuracy of this marksman and this gun.

If the gun is redesigned, if for instance the sights are improved, the accuracy of the marksman will be improved and the variability of his aim reduced. The new distribution of shots will differ from the old in a non-chance manner. We have changed the conditions and our result is different.

These non-chance variations are occurring continually in the factory. Tools wear out, bushings give out, human operators change. If these non-chance variations could be eliminated in a factory tolerances could be set with confidence that they could be held day after day. Spoilage would not suddenly shoot up so that schedules could not be maintained. In other words if the non-chance variations could be eliminated many problems of the factory executive would be solved.

The problem is to locate these non-chance or "controllable" variations. This is where statistics, or the common-sense of number analysis, come in. Most factories have their trouble shooters to discover these controllable variations, but these men are handicapped because the information they obtain from the usual reports is inadequate. For instance, one of the common forms for inspection reports to take is a simple listing of the number of defective units found in a day's work. One day's production may be twice as high as another's, and, under these circumstances, one would anticipate twice as many defective units one day as another, if the

[1] The material for this article was developed while the author was employed by the General Electric Company. For a more technical discussion of these problems see "Economic Control of Quality of Manufactured Product" by Walter Andrew Shewhart (1931, Van Nostrand.)

quality of the product remained the same. Frequently this difficulty is recognized and the number reported defective is divided by the number inspected to give the per cent defective. This is as far as most factories go in systematically analyzing their data, and the failure to go beyond this point has cost them huge sums in unnecessary spoilage.

The next most necessary step is to distinguish accurately between the "controllable" and the "uncontrollable" variations that we discussed earlier. Until we can determine when a variation is due to "controllable" causes we cannot efficiently search for them. Of course, when a small variation occurs, we can scarcely hope to determine whether it happened by chance or whether some definite "controllable" cause operated in a small way. What we can do, and do effectively, is to define how large a variation can occur from the chance or "uncontrollable" variations. When we have done this we have eliminated the danger of a very common error.

The factory executive may notice a change in the per cent defective. Perhaps the per cent defective is 2 per cent higher than the average condition that he has in mind. This worries him, and he calls in the foreman who is responsible for the work in question. The foreman is criticized and thereby irritated; he may know that nothing has happened and that the criticism is unfair. If this executive had been able to estimate the chance variation in such figures, he would never have called the foreman in and unjustly criticized him. Such unjust criticism injures the morale of an organization in addition to wasting the time of all concerned.

On the other hand, and perhaps more frequently, the per cent defective will go up and down beyond the chance limits, and the executive will say, "That is just a chance fluctuation" and pass it by. The next day it may be back down and he is sure that nothing has happened. By this error he may have lost an opportunity to correct a difficulty that will recur later and make more trouble.

In one factory, where I recently set up a system of analysis for inspection data, such an epidemic occurred. Suddenly the per cent defective mounted for a day and dropped back. Under the older practice nothing further would have been done, as the difficulty was apparently past. Under the systematic analysis method this variation appeared to be greater than could be accounted for by chance. Therefore a "controllable" factor had caused the variation. Theoretically, the factory had been set up on a mass production basis, and each day's production should have been of the same quality, except for chance variations. If a varying "controllable" cause was operating, something was wrong in the factory set-up. The fact that the cause had apparently again decreased in importance did not mean that the danger of serious trouble was past. If the factory set-up permitted such a cause to operate in sufficient degree clearly to exceed chance on one day, it probably operated in lesser degree on many days when it could not be distinguished from chance. Moreover, it would probably recur in a more violent form in the future. In this case the cause was traced back to a particular machine, and a slight modification of the machine completely eliminated the danger of such an epidemic recurring. By a succession of such operations the average spoilage on this item dropped from 5 per cent to 2 per cent.

Such results, of course, can generally be shown by concentrated attention, and as soon as the attention shifts elsewhere, trouble recurs.

When the limits of chance variation are recognized the danger of slipping back is almost eliminated. As soon as the first slip occurs attention is momentarily attracted again by the non-chance variations until the difficulty is cleared up. Soon the organization is permanently geared to holding the variations within the chance limits, and spoilage stays down. And at the same time trouble shooting expense can gradually be reduced.

Another place where the recognition of the difference between chance and non-chance fluctuations is important is on the installation of a new machine. No one knows just what a newly designed machine tool will do. It is set up in the factory and a skilled man is assigned to run it. He may immediately be able to turn out as consistent a product as the old machines did. Many factories stop at this point and consider the man a satisfactory operator of the machine. What more should they ask? The machine is meeting the engineering tolerances.

In a recent case, where we went farther and found what the chance variations inherent in the machine were, we discovered that actually the quality was varying over a much wider range than could be accounted for by chance. The operator had not learned to set the machine identically, nor had he learned the ways in which the machine varied. If our study had not been made the operator would not have continued to learn, and the full efficiency of the machine might never have been obtained.

Systematic Classification

In another case poor results were being obtained in certain punch press operations. The die-makers claimed that the dies were satisfactory but that the machine operators, the raw materials punched, or the die-maintenance were unsatisfactory. Similarly the machine operators laid the blame on the other factors. By segregating the results obtained by individual dies, and showing that the variation from one time to another in the work done by a particular die varied by more than chance, actual proof was obtained that the fault was not entirely in the die-making. Similarly, by segregating the records for the different punch presses, and showing that the variation between presses was greater than chance variation, we proved that at least part of the fault was in the maintenance work and operation of the presses. By comparing dies and showing that the variation between dies was more than chance, we proved that part of the fault was in the die-making. Thus, as a result of systematic classification of the data, and analysis of the fluctuations that might be accounted for by chance, we were able to allocate responsibility in a situation that had refused to yield to other attacks.

Controlling the Average Size of Parts

One of the vexing problems that the factory has to meet when a new design is introduced is the problem of tolerances. The engineers design a complicated machine, and in doing it they have to set many interrelated tolerances. Each tolerance may be satisfactory in itself, but cumulatively they may give trouble when too many related items tend toward the high side or the low side. Under usual practice this type of difficulty gives serious trouble because no effort is made to keep the average dimension of the parts made the same as the engineering dimension. Generally, the inspection is made by go and no-go gauges which are set for the engineering limits, and no one knows or inquires what the average size is inside the limits.

In one case recently studied, the engineering dimension for a bearing was .0640″ with an allowable plus .0005″. Naturally the broach used in finishing this was made for the upper limit .0645″, with the thought that any wear would reduce it, and it would still be within the limits. The wear on the broach was slight and breakage was high, so that this practice resulted in most bearings being at the upper limit of .0645″. When the corresponding shafts were anything less than the maximum the clearance became excessive and the results unsatisfactory. It was found possible to make the broaches at .0642″ or .0643″ without any appreciable increase in cost and with much better results.

In general, if machines are maintained and consistently set so that the average size of parts is close to the engineering dimension, with only occasional variations out as far as the engineering limits, a uniform percentage (within chance limits) of defective finished units will result at the end of the assembly line. If the usual factory practice of considering anything inside the tolerances as satisfactory is followed the result is likely to be recurring epidemics of an excessive number of defective units on the assembly line. This is really just a general statement of the principle involved in the illustration above. If two parts such as the bearing and corresponding shaft mentioned above are considered we have an allowable variation of .0005″ in the bearing and .0005″ in the shaft. The limits on the shaft were .06225″ to .06275″. If the shafts were made at .06225″ and the bearing at .0645″ the clearance was .00225″. If the shafts were .06275″ and bearing .0640″ the clearance was only .00125″. Above a clearance of .00200″ the excess clearance tended to allow excessive vibration; below .00130″ there was a tendency for binding to occur. If most shafts were about .0625″ and most bearings were .0642″ or .0643″, the probability of getting an extremely small shaft with an extremely large bearing, or an extremely large shaft with an extremely small bearing would be negligible; but if, as on some days, all the bearings were made at .0645″, then whenever a very small shaft occurred, a defective fit would result. On such days an epidemic of poor fits would occur. Similarly if the holes were small an epidemic of binds would result. These epidemics would occur even if all the parts were given a 100 per cent inspection with a go and no-go gauge that assured that they were all within the specified limits.

In such cases the factory may set closer limits and avoid the bad epidemics. To achieve these closer limits they may have to reduce the speed of the producing machines or make some other expensive adjustment. If factory operators would just recognize the laws of chance they could meet the problem without such expense by merely aiming their machines accurately so that most pieces would be near the center of the tolerance range, and then allow the "uncontrollable" variation to carry an occasional piece near the limits of tolerance.

To achieve such control as is here suggested, the

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Types of Foreman Training

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The problem of foreman training is one of major interest in American industry. Three years of visiting industrial plants, making contact with those in charge of foreman training, and visiting a large number of foreman conferences, has given the writer the basic information for this article. An effort is here made to classify the types or methods of foreman training programs followed and to give an evaluation of these methods.

Types of Training Programs

OF THOSE institutions which have definitely set out on leadership training programs, the different types of programs may be classified as follows:

1. A planned instructional or conference program. *Planned* in this sense is used to indicate a regular scheduled series of meetings. Such a series constitutes a unified course of topics for foremen conferences or class work.

2. An incidental, and in many cases, emergency program of conferences.

3. The co-operative employer-employe approach to the solution of problems, thereby affording training experiences. This type of program for the most part does not follow a planned conference course or a planned sequence of conferences—rather, the current problems of co-operative efforts supply the motivation for meetings and the matter under discussion.

4. The circulation method. The method used is that of distributing circular letters, publications, bulletins, etc.

5. Line supervisory contact. This type of training consists largely of information regarding company policies.

The grade of work done and the objectives attempted in each of these five types are related definitely to efforts of developing group leaders or straw bosses, foremen, and divisional superintendents in manufacturing concerns.

In the field of vocational and industrial education little literature is available on the problem of foremanship training. Vocational education has almost entirely neglected the training of foremen, which should be one of the end achievements of its efforts. It is perhaps for this reason that no type of foreman training, no specific school, and no method has gained anything like notable recognition. One reason for the wide variance in methods is the fact that few industries and businesses which have had planned programs have had time to measure the product of their leadership training efforts. Immediately after the World War a few pioneer efforts were made but they were stopped by the depression of 1920.

Each of the types mentioned above is distinct and has in it many valuable points in leadership training. In many plants one type may be found fairly well developed. Many of the best examples of training and many of the good features in all of the plans cannot be fully appreciated until one visits the institution where the work is being done. The industrial concerns visited were in the north central and eastern section of the nation.

Predominant Features in a Planned Instructional Program

The elements usually found existing in programs which are definitely planned include carefully prepared text material, trained leaders specifically assigned to the task of leading conferences or conducting classes, a specially provided and equipped conference room or classroom, a definite schedule of meeting time, with foremen assigned to specific groups, the use of assignment and quiz sheets and a careful check of attendance.

Instructional material ranges all the way from large bound copies of text material to small booklets or loose-leaf notes. The writer has noted no peculiar advantage or disadvantage growing out of the use or lack of use of any of the various types of printed material. An obvious difficulty may be noted in the use of any type of text material, namely, that the leader is so much concerned about covering the text that he sometimes fails to touch upon the current problems which confront the foreman and which, after all, are applications of the principles presented in the text material.

In some cases, instructors or conference leaders are

men who occupy full-time jobs in the plant. In other cases, they are men employed by the plant to give their full time or the major portion of their time to conference leadership. Some corporations have a staff of men who move from plant to plant for the purpose of leading conferences. Still another method is current, at least in one state, where the Extension Bureau of the State Engineering School furnishes text material and conference leaders. In the opinion of the writer, the more successful conferences are conducted by men who give a part of their time to conference leadership and spend the rest of their time on regular jobs in the plant.

A well-lighted room, far removed from noise and distraction of manufacturing or railroads, equipped with blackboards and facilities for wide use of charts, is almost an essential factor. A room equipped with a long table with a place for the leader at one end, or perhaps better still, a narrow V-shaped table with place for the leader at the end of the V seems to be conducive to the best type of response. The use of roll calls with special emphasis upon promptness and regular attendance gives conferences a businesslike atmosphere. In many institutions the conference room seems to be about the only place where the foremen can sit down and quietly and seriously consider their problems and talk them over with someone else. Perhaps after all, this businesslike systematic thinking on the part of the foreman is one of the greatest contributions which foremen training can make. This is a matter of habit formation.

Needless to say, the conference room should not be equipped with a telephone and there should be some regulation which would forestall the frequent calling of men from the conference.

Incidental Plans

The writer does not wish to be critical in discussing those types of training which are somewhat incidental in nature and in many cases are set up to meet emergencies only. Apparently, programs of this type are on the decrease. However, they do have certain values not always to be found in the more formally planned programs. These advantages consist of the flexibility of program, the spontaneity of response, and the freshness of material. This is due to the fact that the problem is the psychology of the moment, or of the situation. Perhaps the best description of this type of program can be made by telling of an experience in attempting to visit a conference in a certain large corporation. In answer to his request for permission to visit and to sit in on foremen conferences, the writer received the following reply:

> "If you will let us know what time you can be here and in what subject you are most interested, we will try to arrange a conference to suit both your interests and your convenient time."

Undoubtedly the chief drawback to a program of this type is in the likelihood of its failure to operate. Apparently in a good many institutions where this type is followed, no one is directly responsible for the training of supervisors or for the general direction of incidental meetings for training purposes. Procrastination is largely in evidence and where the pressure of production is as great as it is in most institutions, it is an easy matter to center all thought and attention on that important phase of manufacture. It is doubtful if the best accumulated knowledge on industrial problems can be passed on to a group of men who have been rounded up rather hurriedly. It is unlikely that there will be any continuity of thought or progressive development in conferences which are held under such conditions.

Foreman Training Through Co-operation with Employe Representation Plan

This plan as being used seems to involve instruction under a number of heads, as follows:

Standard Instructions
Lines of Supervisory Contact and Authority
Principles of Personal Leadership
Backgrounds of Corporation Problems
Process and Production Methods

It is undoubtedly true that under this plan all supervisors must receive thorough instruction in the way of council minutes, joint agreements, etc. Under the plan it is necessary to hold joint meetings between supervisors and employes. This plan provides intimate day to day working relationships between the supervisors and the workmen and between the supervisors and their superior officers. This type of program maintains a fine intimate and continuous personal relationship throughout the organization and it is a relationship which may be missed entirely under any other type of supervisory training program. Concerns following this plan present the argument that the usual topics to be found in a formal training program are names of symptoms of faulty operation, selection, maintenance, etc. Another argument is that there is often too little action

on the part of supervisors if the training program is made too formal.

Undoubtedly, participation in the activities of an employes' organization is of great value in training supervisors. Objections to this plan are to be found in the fact that, to a large measure, employes and not the company direct the content and procedure as well as the progress of the training of foremen. Unless some special machinery is set up, there may be a serious neglect in the training of prospective and new foremen before or immediately after they come upon the job. Furthermore, a careful perusal of the minutes of the meetings of employe groups does not reveal any systematic arrangement of material for guiding the thinking of foremen. The system undoubtedly has distinct values, particularly in companies of long standing where employe representation or collective bargaining has become well established. Undoubtedly all of the good features of this plan could be incorporated into any vigorously supervised and carefully planned program of instruction.

The Circulation Method

One often hears the superintendent say, "We resort to occasional letters or a periodical bulletin, which we purchase." In many institutions foremen and supervisors are called together occasionally for a picture show or an outside speaker. The difficulty with the circulation method is the fact that the element of personal contact is entirely missing. There is no way to determine the reaction of the men who are supposed to receive the training, and further, there is no way to measure, even subjectively, the value of the effort being put forth. The total result of this method or type of training may best be represented by an experience of the writer.

A number of years ago he was called into the office of a vice president. This executive wished to know why superintendents in the factory were not answering a series of circular letters which he was sending them. Apparently this executive worked from his desk only. Men in the plant did not know him. Letters lacked a personal touch and at no time did these letters approach actual plant problems which should have been discussed between this top supervisor and the foremen in the plant.

Line Supervisory Contact

In some institutions the efforts of training are to be found in direct line contact. The manager of the plant calls in his superintendents. Certain problems are discussed. In many cases the discussion is one-sided; the manager does all the talking. The superintendents, in turn, call in their foremen. These foremen in turn are supposed to have a meeting with their group leaders or straw bosses. In many cases there is no follow-up. No one makes an effort to institute any method of checking up to see whether the information handed out at the front office ever actually reaches the group leader. For the most part such methods used in industrial concerns lack purpose and definiteness. The chief handicap in carrying on such a program is the fact that there is apparently little transfer of information or ideas. It is a one-way telephone call which does not enable top management to learn what the foremen and group leaders think about their jobs or about the management in general.

Master Conference Session

Foreman training is the core of any educational program in an industrial institution. I found it most effective in those institutions which used a master conference. As already indicated, superior values are derived from text material which has been prepared in the plant in which it is being used and many institutions are giving considerable attention to the preparation of their own foremanship training material. In some of the larger corporations, preliminary preparation of material is done in the general offices. However, this material is often rewritten, changed, and materially modified in the final plan.

Foremanship training in any institution will be successful only to the degree to which top management, meaning superintendents, vice presidents, etc., become enthusiastic about it and also to the extent to which they know what is being attempted and how it is progressing. Undoubtedly much is to be gained by having proposed material presented first to a master group consisting of conference leaders, superintendents of divisions, vice presidents, special personnel officers, etc.

Judging from observations made in various companies, material seems to be most effective when presented in master conferences a considerable time prior to the date of its actual presentation in the foreman conferences. Consideration of text material in master conferences makes it possible for all those in higher executive positions to pass judgment and criticism upon the subject matter as well as upon the general methods to be followed in its presentation. The master conference session seems to be best adapted to that type of

foreman training which is carried on by planned instructional procedure.

Training Conference Leaders

The training of conference leaders is not a major topic of this paper. However, something should be said about it as it is a problem related to the various methods of carrying on foreman training. Needless to say, conference leaders must be trained. A well-directed reading program for conference leaders and prospective conference leaders makes a fine contribution to the training of any man. Experience and observation in the master conferences afford another splendid means of training. Many institutions have turned over the training of conference leaders to directors from the bureau of vocational education or to some specialist from a trade association. In other organizations the director of education has gathered his leaders and prospective leaders about him and has carried on a short, but intensive training program. There are certain distinct advantages in the latter plan due to the fact that training is never as successful when divorced from actual subject matter as when it is closely related to the topics and program of work to be undertaken by the leader.

Methods of Conducting Conferences

Actual methods of conducting conferences vary widely and range all the way from the full conference method to the complete lecture method. Many conferences of each of the extreme types have been observed as well as a large number of conferences which use a combination of these two types. The complete conference method does not seem to be used effectively, perhaps because men are not trained in group thinking and also because there is always a large element of instruction that must be presented in connection with most topics used in foremen conferences. This instruction must be supplied in one way or another by the conference leader.

The full lecture method is usually ineffective. In the first place few leaders in industry are able to lecture entertainingly. In the second place a foreman training conference should bring into play a great many shop experiences. The lecture method does not provide any place for this. In the third place, if a foreman training program is to be really effective, the foremen themselves must make a large contribution. This, of course, is not possible under the lecture method. Undoubtedly a combination of the methods, with occasional work sheets, case problems, and frequent snappy quizzes or

ANALYSIS OF EDUCATIONAL PROGRAMS AND RELATED FACTORS

(This sheet is set up to give emphasis to the achievement of industrial economy)

Legend: 3 = High, 2 = Average, 1 = Low, X = No basis of evaluation

	Adequate Interview	Proper Investigation	Physical Health	Test Evaluation	Guidance in Further Training	Psychological Analysis
1. Selection and Follow-up Procedures						
	A.—Scope					
2. Training and Development Program	Job Training	General Upgrading	Top Executives	Supervisory	Apprentice	Graduates in Development
	B.—Quality					
	Instructors	Text Material	Sequence of Programs		Functional Co-ordination	Contribution from Top Executives
3. Job Evaluation and Rate Classifications	Training of Those in Charge	Degree of Co-operation	Serviceable Records		Cumulation of Research	Values Understood and Accepted
4. Promotion and Employment Plans	Job Requirements Known	Chart of Advancement	Promotion Standards		Personal Efficiency Ratings	Recognition of Job Training Completed
5. Incentive Program	Fair Base Rate	Salary Advancement Plan	Analysis of Costs		Acceptable Time Studies	Policies Properly Presented
					Total Points ————	

reviews, provides the means most conducive to satisfactory and lasting results.

Measuring Results

It is impossible in brief visits to arrive at any definite conclusion as to the total value of various foreman training programs. This difficulty is perhaps increased in the case of those institutions where the educational program occupies an extensive over-all position and so entirely integrates many phases of institutional work. However, as a guide in objective thinking, the writer has prepared a score sheet on which he has checked a number of institutions. A copy of this sheet is presented on page 146.

The five criteria listed in the score sheet cover all aspects, direct and indirect, of an educational program. Items for each criterion are such as to enable an experienced industrialist to arrive at a fair conclusion as to the effectiveness of a program.

Considerable interest will be manifest in the coming years in the evaluation of money and effort spent on foreman training. Some companies are now using a score sheet on which their own foremen are asked to evaluate the return to the company on various items of foreman training. This method seems to be a much more reliable one than that used and presented here. The writer himself has made use of the method of having foremen evaluate their own training. The method used and a summary of the results will be presented for publication elsewhere.

* * * * *

Those interested in rating methods for foremen and executives may well find useful, in addition to Mr. Humke's above proposed rating schedule, the two alternate forms reproduced below.

The first is reprinted from ARMCO'S *Foremen's Bulletin* through the courtesy of The American Rolling Mill Company.

The second, in use in a number of companies, was supplied by the courtesy of the Elliot Service Company.

HOW GOOD A MANAGER ARE YOU?

The questions listed below cover the water front. They touch upon almost every phase of department management. How do you rate?

No one is expected to make a perfect score—none of us is perfect. Don't kid yourself by grading high unless you feel beyond the shadow of doubt that you deserve a high score. Be a severe critic of yourself: But above all things try to do something about improving yorself on those points where you rate yourself low.

Ready for the questions? Here they are:

1. Do you know your company's policies well enough to explain them clearly and thoroughly so your men will understand the company's exact position on wages, working conditions, and other points in which they have a vital personal interest? 10 — 7½ — 5 — 2½ — 0 _____

2. Do you take your company's policies into consideration when making decisions? 10 — 7½ — 5 — 2½ — 0 _____

3. Are you in the habit of analyzing your problems thoroughly before making decisions or do you sometimes make hasty decisions and repent afterward? 10 — 7½ — 5 — 2½ — 0 _____

4. Do you honestly feel that every man under you has confidence in your knowledge of the job? 10 — 7½ — 5 — 2½ — 0 _____

5. Can you say with confidence that every man in your group feels free to come to you with his problems, personal or otherwise, knowing that you will promptly and cheerfully discuss any problem which may be bothering him? 10 — 7½ — 5 — 2½ — 0 _____

6. Do you always insist on maintaining a clean, orderly shop and do you take the lead in recommending new and necessary improvements affecting working conditions? 10 — 7½ — 5 — 2½ — 0 _____

7. Do you always promote the best qualified man when a better job is open absolutely without favoritism? 10 — 7½ — 5 — 2½ — 0 _____

8. Do you always insist that quality standards be rigidly maintained without ever letting a low-grade job pass in the hope that it will get by? 10 — 7½ — 5 — 2½ — 0 _____

9. Are you satisfied that your costs are the best that can be attained with present equipment? 10 — 7½ — 5 — 2½ — 0 _____

10. Are there any unsafe conditions in your department which could have been corrected, but which have not been fixed? 10 — 7½ — 5 — 2½ — 0 _____

11. Can you honestly say that every man in your group with a year or more of service is a well-trained man? 10 — 7½ — 5 — 2½ — 0 _____

12. Are you satisfied that nothing is being wasted in your department? 10 — 7½ — 5 — 2½ — 0 _____

Any supervisor who scores 91 points or more is outstanding; 71 to 90 points is a good rating; 51 to 70 is average; while those who score less than 50 should be gravely concerned about improving their ability as managers.

GRAPHIC RATING REPORT

Before attempting to rate this person reread carefully the definition of each quality immediately before rating in that quality. Base your rate on the work the person is actually doing at the time. Indicate your rating in each quality by a check (V) on the line just where you think it ought to be. For instance in Quality 4, if you think the person ranks somewhere between Fairly Effective and Lacks Planning Ability, place the check between the two, either midway or nearer the one than the other.

NAME OF PERSON BEING RATED——— DEPT.——— NAME OF EXECUTIVE DOING RATING———

QUALITIES	REPORT				
1. Consider his success in winning confidence and respect through his appearance and manner.	Impressive	Favorable	Indifferent	Unfavorable	Repellent
2. Consider his success in doing things in new and better ways and in adopting improved methods in his own work.	Highly Constructive	Resourceful		Fairly Progressive	Routine Worker
3. Consider his success in winning the co-operation of those in his department and in welding them into a loyal and effective unit.	Capable Leader	Handles Others Well		Fails to Command Confidence	Frequent Friction in his Department
4. Consider his success in organizing the work in his department, both by delegating responsibility wisely and by making certain that results are achieved.	Very Effective	Fairly Effective		Lacks Planning Ability	Inefficient
5. Consider his success in making his department a smooth running part of the whole organization; his appreciation of the problems of other departments.	Exceptionally Co-operative	Co-operative	Not Helpful	Difficult to Handle	Obstructionist
6. Consider his success in improving his subordinates by imparting information, creating interest, developing talent and arousing ambition.	Develops Workers of High Calibre	Develops Workers Satisfactorily		Neglects to Develop Workers	Discourages Workers
7. Consider his success in applying specalized knowledge to his particular field, whether his own knowledge of ways and means or through his use of sources of information.	Expert	Competent		Uninformed	Neglects and Misinterprets the Facts
8. Consider his ability to meet unusual situations.	Unusually Resourceful in meeting an Emergency		Generally Competent in Emergencies	Hesitates	Becomes Flustered
9. Consider the promptness, thoroughness and accuracy with which he begins and finishes a piece of work.	Very Prompt Thorough and Accurate	Delays a Little but Thorough and Accurate	Starts Promptly but does not Finish Thoroughly		Puts off Starting and Rarely Finishes
10. Consider his example in industrious and interested application to his work.	An Excellent Example to Others		Would not Consider a Good nor Bad Example		A Bad Example
11. Consider his judgment as expressed in his opinions.	Experience indicates his Judgment almost Invariably Correct		Judgment Good About Half the Time		Opinion Almost Invariably Bad

DATE——— FINAL RATING——— (Not by Rates) TOTAL RATING——— (Not by Rates)

Applied Scientific Management[1]

XIII. Organization—The Auditor's Department

By KING HATHAWAY
Consulting Engineer, San Francisco

IN TAYLOR'S original description of his accounting system he said:

"The system should be so planned as to render the temptation to steal of those handling money as small as possible and also to render the complicity of at least two employes necessary in order to accomplish theft, and in case of theft or error to enable an auditor to detect and trace the same readily and rapidly."

Having this in mind in developing his system of organization and management, Taylor set up several fairly automatic safeguards, recognizing that irregularities might in most instances be expected to take place in those departments having to do with purchasing, billing, receipt of money, and its disbursement. The more important of these safeguards were:

A. The two bank system, mentioned on page 56, Chapter V of this series (*Bulletin of the Taylor Soceity,* Volume XVIII, No. 3), Taylor described as follows:

"At least two bank accounts should be kept by the company. In one bank which is called the company's bank should be deposited every cent that is received by the treasurer of the company immediately on its receipt, and the other bank should be instructed never to receive any deposits or checks from the treasurer except two signature checks drawn from the company's bank. The other bank is called the treasurer's bank.

"The treasurer should not be allowed to pay out money from the two signature or company's bank unless the check is countersigned by either the president or one of the authorized directors of the company, while he should be authorized to pay checks from his bank at any time on his own signature. The treasurer then makes all his payments from the treasurer's bank and deposits all his receipts in the company's bank. The treasurer should give bonds up to, say, $5,000.00 or $10,000.00 at least, even in a small company, and he should never be allowed to have in his own bank more than this amount, the money being given him from the company's bank at such frequent intervals as will render it unnecessary for him to have more than this amount. This relieves the treasurer from the temptation to steal."

Briefly stated the functions of the Auditor's Department comprise:

1. ***Approval of bills and vouchering for payment.***
2. ***Checking and vouchering payrolls.***
3. ***Checking and approving expense accounts.***
4. ***Checking and verifying bank accounts.***
5. ***Conducting systematic check of inventories.***
6. ***Systematic checking and vertification of Accounts Payable and Receivable.***
7. ***Routine checking of internal accounting.***
8. ***Checking paid vouchers in connection with reimbursements of Cashier's bank account.***

This differs from my own description in Chapter V in that what I have referred to as the Cashier's bank account was originally designated as the Treasurer's account and the main or receiving account to which I referred as the Treasurer's account, was called the Company's bank account by Taylor. This change in designation was in effect when I became associated with the Taylor group.

Not the least of the merits of the two bank system lies in the relief afforded major executives from the time consuming task of signing a large number of checks, many for insignificant amounts, covering a multitude of transactions concerning which the executive is in most cases completely ignorant. Not only is the time of the executive wasted but often that of others who may be waiting to take up with him some matter of importance. The situation is doubly bad when every check must be signed by two major executives.

B. Isolating purchasing from any other activities having to do with such transactions as receiving, inspec-

[1] This is the thirteenth in the series of articles on "Applied Scientific Management" which began in the October, 1932, issue of the *Bulletin of the Taylor Society.*

tion and storage of incoming materials, the approval of vendors' bills, accounting in connection therewith and payment for goods purchased or for services rendered.

C. Establishing the position of Auditor as a function separate from purchasing, accounting and the handling of funds under an individual reporting to the General Manager.

As stated in an earlier paper of this series, under the Taylor System of Scientific Management a purchase order is issued to cover all goods purchased as well as for services contracted for to be rendered by outside parties. Several copies of each purchase order are made for the use of the various parties in the organization concerned. For example, one copy is sent to the person who originated the requisition; a copy to the stores-keeper; another to the Receiving Department if it were not an adjunct to the Stores Department; and another to the Auditor.

In connection with auditing and vouchering of charges for goods received from vendors, the procedure would be as follows: the stores-keeper or receiving clerk, upon the arrival of the goods, would check them to see that they agreed in quantity and kind with the purchase order and would, on a form provided, notify the Purchasing Agent that the goods were received and that they either were or were not in accord with the purchase order. This would serve the purpose of letting the Purchasing Agent know that he need not follow up the order any further if the report showed that the right material and quantity had been delivered, or to enable him to take up with the vendor any matter of shortage or deviation from specification in the materials supplied. At the same time the party receiving the goods would send to the Planning Department another notice written on its appropriate form indicating that the goods were waiting for inspection before being put into the stores or accepted for delivery to the department for which they had been ordered, as in the case of new equipment or other special materials not regularly carried in stock. He would also send to the Auditor a duplicate of the notice sent to the Purchasing Agent advising him of the arrival of the goods.

The Planning Department would then arrange for inspection of the goods by a properly qualified person who might be one of the regular shop inspectors in the case of commercial materials regularly used in the plant; or an engineer from the Engineering Department in the case of new equipment, the examination of which might require special technical knowledge; or someone from the Works Laboratory in the case of special materials which required physical or chemical testing.

After such inspection had been made, the person making the inspection would report his findings on a form provided for the purpose, sending this report through to the Auditor. A copy of this report would also be sent to the Planning Department so that proper orders might be issued for disposition of the goods.

As these reports are received by the Auditor he attaches them to his copy of the Purchase Order. The first notification of the receipt of the goods, and that they agree in quantity and kind with the order, would result in his following up the transaction to be sure of receiving in due course the inspector's report as to quality. When he has received and checked the two reports mentioned with the Purchase Order he will, if he finds them in accord, make out a voucher authorizing payment for the goods received. In the case of a number of small purchases being made during a month from the same vendor, he would accumulate the approved purchase orders for goods supplied, entering them all on one voucher. The copies of purchase orders supplied to various individuals in the plant would show on a margin which is detached from the original sent to the vendor, the account symbol to which the cost of the goods should be charged and this charge symbol would be shown on the face of the voucher for the benefit of the bookkeeper who makes the entry in the Register of Accounts Payable. For the greater part of the materials purchased, the charge would be to the Purchased Stores Account. This would be true with respect to the supplies and materials used in manufacture of products or in plant operation as well as in the case of almost all other material of a physical nature even though it might go into stores only on paper and be issued immediately to the department for which it was purchased—in which case a stores-issue slip would be made out serving the purpose of clearing the stores account and debiting the proper expense or asset account. In the case of services such as for telephone, water, and even less tangible services, the charge would be made directly to the account concerned.

Inasmuch as all purchase orders for materials, with very few exceptions, should indicate the pre-arranged net price to be paid, there is, at least theoretically, no reason why the company should be concerned with the vendor's invoices and in my experience I have known companies which, with few exceptions, disregarded them completely. However, it is customary to have all invoices sent to the Auditor who compares them with

his copy of the purchase order with a view to checking any discrepancies and having them cleared up before approving and vouchering the purchase order. This seems worth while in order that any errors or misunderstandings on the part of the vendor may promptly be straightened out.

All freight bills are sent to the Auditor, as in most cases the amount of the freight should be added to the cost of the materials.

Having approved and vouchered a purchase order for materials going into stores, the Auditor sends a notice to the Balance-of-Stores Clerk in the Planning Department indicating the purchase order number, the quantity and the cost plus freight, advising the Balance-of-Stores Clerk that he may enter the materials concerned and their values in the "On Hand" column of the Balance-of-Stores Sheet for the material in question.[2]

In the case of new equipment or special stores, the notice described above indicating cost and freight charges would go to the cost-keeper who would make the appropriate entries to a cost sheet upon receiving a stores-issue slip if the goods and freight had been handled through the stores account, as would in most cases be the most convenient method.

In the case of services or other transactions not handled through the stores account the charge would be shown on the voucher and made directly to the account or accounts ultimately concerned—both in the matter of cost of the equipment or special materials (if so handled) and freight charges pertaining thereto.

In case there are only a small number of freight bills per month, the Auditor would check them with tariffs, but in a business where freight is an important item of expense, this would be done in the Traffic Department. In doing this checking, the Traffic Department would be acting as an extension of the Auditor's Department and it would be the responsibility of the Auditor to satisfy himself as to the accuracy of the work.

When a vendor's account has thus been audited and approved for payment, the voucher goes to the Accounting Department where it is immediately given a number, entered on the Register of Accounts Payable and posted to the appropriate detailed ledger account as described in Chapter V, pages 57, 58, and 59 of this series, (*Bulletin of the Taylor Society,* Volume XVIII, No. 3). From the Accounting Department the voucher goes to the cashier to be paid in due course.

As orginally laid out the plan provided for a voucher distinct and separate from the check. These carried on their face the name and address of the creditor, the purchase order number and numbers and amount to be credited, and on the back provided for indicating the accounts to be debited. They were given a voucher number as they were entered in the Register of Accounts Payable and in due course were sent together with a separate check bearing its own number to the creditor who was required to receipt and return the voucher. This practice was superseded by a more convenient combination of voucher and check in a single form which insures the return of the voucher if the check is cashed or deposited.

Companies using voucher checks have, in some cases, complicated their problems by numbering both vouchers and checks in advance as well as by attempting to make one number serve both purposes. It greatly simplifies matters if two series of numbers are used: one being a *voucher* number assigned at the time of entry in the Register of Accounts Payable and the other a *check* number assigned at the time the check is signed and entered in the cash book as a disbursement. Although the voucher and check are combined on one piece of paper, it must not be lost sight of that two distinct transactions are involved. It is simply a voucher approving an account for payment and not a check until such time as the *check* portion is signed by an authorized disbursing agent.

The Auditor keeps copies of all approved vouchers to which are attached his copies of purchase orders, the report slips, invoices, etc., pertaining thereto, in a file having three sections:

a. Not yet paid.
b. Paid, but original not yet returned from the bank.
c. Original returned from bank being accumulated pending reimbursement of cashier's bank account.
d. Completed transaction file of originals and duplicates.

These copies advance from one section of the file to the next as the transaction progresses. It will be seen that this voucher file facilitates the Auditor's work of periodically checking bank accounts and accounts payable.

For the purpose of checking payrolls, the Auditor must set up his own mechanism. He should have a strictly up-to-date file containing a card for each employe in each department of the business. This card

[2] *See* Chapter VI, page 6 of this series, *Bulletin of the Taylor Society,* Volume XIX, No. 1 and also Chapter XXII, page 360, "Scientific Management in American Industry" by the Taylor Society, Edited by H. S. Person, Harper & Brothers, 1929.

should show the name and address of the employe, the wage or salary rate at which he is employed, any changes in rate of pay, as well as the date an employe may have left the service of the company. The system must be so arranged that he will promptly receive notices with respect to the foregoing. He must make such check-up of the time-keeping system as may be necessary to assure him that it is being properly carried out and must receive reports with respect to employes who are late, absent, or who leave the plant ahead of the regular time. He must verify the rates of pay and extensions for all individuals on the payroll and having satisfied himself that the payroll is correct he passes it through to the bookkeeper accompanied by a voucher to be handled through accounts payable in the same manner as in the case of any other creditor—in this case the creditor being collectively the company's employes who are grouped under one account called "Payroll."

After having registered and posted to Accounts Payable, the payroll goes to the Cashier who under prevailing practice would draw a check on the Cashier's bank for the total amount to be transferred to a sub-bank account against which only individual payroll checks would be drawn. These payroll checks may be signed by someone other than the Cashier who is specially authorized to sign them. If it is considered desirable in order to keep the General Manager informed with respect to payrolls, a blanket check for the purpose may be drawn on the Treasurer's or Company's bank account as would generally be the case with respect to salary checks for the higher executives. In regard to the actual payment of employes, Taylor followed the plan of having the payments made by one person who might be from the Cashier's section of the Controller's Department or from the Time-keeping or Payroll Department, while another person from a different department (preferably from that of the Auditor's) checked off the payments as made on the payroll. These two then signed the payroll—one stating: "I have personally paid each of the individuals on this payroll except those marked 'not paid.'" The other signed a statement to the effect: "I have personally seen each person on this payroll paid excepting those marked 'not paid.'"

The pay checks for any of those not present to receive their pay were then returned to the Cashier who took suitable steps to assure these parties receiving their checks, sending a memorandum accompanied by signed receipts to the Auditor listing the people who had not received their checks at the regular time in order that he might make such investigation as he might deem proper.

In regard to the verification of inventories, it must be borne in mind that under a system of Scientific Management a physical check is being made continuously; each day a number of items being actually counted and the quantity actually found to be on hand of each item compared with the quantity shown on stores bin tags and the quantity shown to be on hand on the Balance-of-Stores Sheets, any discrepancy being investigated and corrected. The Auditor should be responsible for seeing that this systematic check of inventory is faithfully and regularly carried out. He should also at regular intervals check a number of Balance-of-Stores Sheets to see that they are being posted accurately and that the quantities, unit prices, and money values are in accord. Likewise he must make or have made at proper intervals a check to insure the sum of the values on the Balance Sheets of any stores group or sub-division of the General Ledger's stores account agreeing with the balances shown on the ledgers at the time. In short, it is his duty to see that the sums of the supporting details of the several stores accounts agree with the corresponding General Ledger accounts.

With respect to work in progress, he must see that the sum of the costs shown on the individual cost sheets for unfinished production orders agree with the General Ledger work-in-progress account. In the same manner he must assure himself that *all* detailed ledger accounts agree in total with their respective General Ledger accounts.

Periodically, the Auditor should send out to parties from whom the company buys or who render it service a memorandum of its indebtedness to them with a request that they advise him whether or not the figures shown agree with their books. If there are many accounts this work may be spread out over the year; a certain number being checked during each month.

Similarly, in regard to Accounts Receivable, the Auditor should at regular intervals send out statements to the company's debtors with the request that he be advised whether or not the figures shown agree with the customer's books—this being done independently of the statements regularly sent out by the Accounting Department. In order that no shipments may go out of the plant without having been invoiced and charged to the customer, copies of all papers pertaining to outgoing shipments should go to the Auditor who would check them currently to see that they agree with the

shipping order. The Auditor should maintain a running balance of unfilled purchase orders from which he would furnish the information in regard to this matter for the daily statement of transactions compiled by the Accounting Department.[3]

Taylor laid considerable emphasis upon the system of accounting being so designed as to insure daily posting of all current transactions and to facilitate prompt closing of the books at the end of the month or other accounting period. The Daily Statement of Transactions made up for the purpose of keeping the major executives posted is in itself an important means to this end, as are also the various monthly reports described in Chapter VI of this series. The Auditor must see that these reports come through regularly on time, investigating and reporting to the General Manager any failures. He must see that the running balances shown on the daily statement progressively agree from day to day and that the figures for the last day of each month agree with those on the monthly statements. He must also check to see that posting of initial entries in the Cash Book, the Registers of Accounts Receivable and Payable and other journals are kept up to date. He must give special consideration to all entries in the General Journal in the nature of adjustments, corrections and prorations.

Credits to customers' accounts other than by cash would be checked by the auditor who would prepare for them either a cash voucher or a journal voucher as might be appropriate to the case in question. It will be evident that the Auditor occupies a position of confidence and trust and that consequently he should be a man carefully selected with respect to integrity and painstaking accuracy. Although he is a regular employe of the company, his relationship to the business is similar to that of the company's outside auditors.

It will also be seen that while this function may have originally been conceived as a safeguard against fraud and error, its greatest value in the absence of either of these may lie in the influence that it has upon the handling of the company's affairs in a systematic, orderly and punctual manner.

[3] *See* Chapter III, page 8, *Bulletin of the Taylor Society*, Volume XVIII, No. 1.

Annual Conference Announcement
See back cover!

ANNUAL DINNER

Reserve Thursday evening, December 9, for the Annual Dinner.

The following awards will be presented:

Gilbreth Medal.

Harrington Emerson Trophy.

"Day Work Vs. Wage Incentives" Contest Award.

Taylor Keys.

The Purchase of New Machinery and Equipment[1]

By W. P. KIRK
Vice-President, Pratt and Whitney Company, Hartford, Conn.

Replacement viewed from the angle of competition and taxation.

Obsolescence and depreciation as factors in cost of product.

The Need for Efficient Equipment

NO CONCERN without proper equipment can hope to remain in business against competitors whose plants are efficiently equipped. "Proper equipment" does not mean that all machines must be new, or not over an arbitrary number of years old, but that each is balanced properly with the whole and performs its particular operation at a cost that compares favorably with that which can be obtained on any other machine that might be used.

There is a law in economics that "*competition* sets the selling price"—not collusion, where competitors get together and fix prices on a basis of "all the traffic will bear," but by manufacturing at a lower cost.

In other words, production efficiency determines the cost and competition sets the selling price. Profit must come out of the difference between the cost and the selling price.

The Need for Depreciation Reserves

The purchase of new equipment is justified when doing so will contribute materially in helping the concern to maintain or to advance its position in its particular industry, either by reducing its costs, or by improving the quality of its product, or by doing both.

If we are to get the most out of our investment in factory equipment, we must have some kind of a system for keeping costs. In this system will be a rule for writing off depreciation so that we can get back in our cash account the money that was invested in our present equipment as soon as, or before, it is necessary to make replacement.

It seems that too many concerns do not realize: (1) That the purpose of depreciation is to get back in cash account the money that was originally used to purchase the equipment that is being depreciated. (2) That writing off depreciation and using the money for any other purpose but *depreciation reserve* and proper replacement, will lead to embarrassment and perhaps disaster when it is discovered that there are no reserves for replacement.

I want to emphasize the point that the money put into the original equipment was an investment. The depreciation allowance that is set aside is for the purpose of getting that money back so that it can be used over again when replacement is advisable.

Think of the salesman who received ten cents a mile for operating his automobile in his company's use. The actual cost of operation was only five cents per mile. At the end of 20,000 miles he might have had $1000.00 towards a new car, but he did not have it as he had spent it for other purposes each month when he received his expense check. Like many manufacturing concerns, he considered the extra five cents per mile as "profit." However, this individual woke up in time to save some of the extra out of the second 20,000 miles' operation, even though the car was one year older and needed repairs and service.

When to Make Replacements

Replacement cannot be made in a wholesale manner. It is not sound to say that every machine must be replaced in, say, ten or even fifteen or twenty years. Replacement is an individual thing. A study must be kept of each machine so as to know its productive ability and cost of obtaining it and expense in keeping it in operation. We all know of cases where it has been advisable to replace a comparatively new machine in one year, because that type has been superseded by a more efficient model, or because a change in design of the product has eliminated a certain operation and the need of the machine. It is for such reason also that a flat rate of depreciation is not always safe.

Sometimes the justification for a purchase is confused with the question of "How to get the money to pay for

[1] Presented at a meeting of the Northern New Jersey Chapter of The Society for the Advancement of Management, April 8, 1937.

it." *"Justification"* is a cost of production matter. *"Getting the money"* is a management matter.

Without getting involved in complicated formulae, let's say that the purchase of new machinery is justified when the savings obtained by its installation will absorb the depreciation and other annual items that are chargeable to the cost of the product. Profit to be made is not chargeable to depreciation.

In calculating the return on the investment in the new machine and comparing it with the old, the same factors must be used. In this comparison the annual output of the old and the new equipment must be the same.

All of these go into the cost of the product:

Depreciation; Insurance; Taxes; Maintenance and Repairs (down time); Power; Rent (floor space); Operating costs (labor, oil, etc.).

Note important items:

Improved quality in product; Lower inspection losses; Less waste in machining; Safety and mental attitude of operators (intangible but important).

The industrial concerns that will be in successful operation in ten or even five years from today will be those that today are doing everything possible to get a better understanding of the necessity of keeping their manufacturing equipment up to a high standard of efficiency, of having expert knowledge, not only on equipment, but on depreciation and taxation and how today's tax laws will affect the future of our industries for many years to come.

In trying to find the best answer to our question, it might help us to set up definitions of a few terms that are in general use when this important question is discussed. It seems to me to be suitable to use the definitions adopted by The Machinery and Allied Products Institute.

Obsolescence.—The loss in value of an asset brought about by exhaustion of raw materials, or the development of another asset that will better do the same thing or replace the product before the original estimate of the life of the asset has elapsed and the cash recovered through depreciation.

Extraordinary depreciation of an asset resulting from development of new processes or inventions.

Maintenance.—Ordinary repairs to an asset, to permit of efficient operation, that do not prolong the original estimated useful life of the asset nor materially increase its productive capacity.

Rehabilitation.—Restoring the useful value of an asset acquired in such condition that economic operation is not possible; expenditures which will increase production or extend the useful life of an asset. The rebuilding of destroyed parts so that the unit as a whole again becomes economically useful.

Depreciation.—The shrinkage in useful value of an asset chargeable as a cost of production upon such basis as may be estimated.

Depreciation Reserves.—The accumulation of the amounts periodically provided for the loss in useful value of an asset, based on the estimated productive life resulting from wear and tear, or more generally from time and based on knowledge that within a reasonable time some other asset will be developed to replace it. Cost must be recovered from product sales to prevent a capital loss.

What is wanted is a plan by which the shrinkage in the useful value of the asset may be charged into the cost of the product. The total depreciation which will take place during the useful life of the asset is the difference between the original value and the value at the end of its useful life for the purpose for which it was obtained.

If depreciation reserve estimates are fairly accurate, it should not be difficult to make replacement studies which will be good guides to tell us when new equipment is justified,—that is, to answer our replacement problems.

Most managements have known for a long time that there is such a thing as "obsolescence" and "depreciation" and have each year set up replacement funds, but, like the salesman, have not used them for that purpose. The 1936 Revenue Laws will take care of that condition. Uncle Sam says you may have a reasonable replacement fund, but it must be in line with your conditions. He wants your rate to be as small as possible; that will make your profits larger and therefore your surplus greater, which means that his "cut" will be greater, and he needs it! Do not forget that if you try to make your depreciation rate too high,—you lose out also. Therefore, it is up to us to make a careful study of our conditions and make our depreciation as high as is soundly consistent with our kind of product and with the type of equipment that is used to make it.

If we have factual data to support our rate, we shall have little trouble from the tax authorities.

But, most important, we shall have no worry about how to finance the purchase of the needed equipment if we understand the meaning of "depreciation reserve."

Assuming we understand that meaning, and have acted according to its principles, we have protected our

capital investment and have included in the product cost a suitable rate for depreciation reserve. We have not overlooked the fact that certain types of machines become obsolete rapidly. It is not age alone, but also lack of usefulness, that makes machines and equipment obsolete.

To have a unit rate, rather than a standard rate of depreciation, thus avoiding the trouble of unexpected obsolescence, is becoming more common. It is obvious that a rate that would be satisfactory for standard machines, like lathes, planers, drill presses, etc., and toolroom equipment, would not be suitable for high production and for automatic machines; nor would the rate for standard type automatic machines be suitable for machines built especially for a certain operation or product. The farther a machine is from standard purpose, the higher the depreciation reserve rate should be.

To Summarize

In order to maintain capital assets:

1. *Maintenance* cost must go into the cost of the product in *Depreciation Reserves.*

2. *Rehabilitation* cost must go into the cost of the product in *Depreciation Reserves.*

3. *Depreciation* must go into the cost of the product. It is not profit or surplus to be used for any purpose except to restore the capital asset to its original state by the purchase of new equipment to replace that which was depreciated.

4. All monies collected through selling price for reserves shall be properly accounted for and subject to budget for new equipment.

5. If the depreciation reserve on a particular machine is not sufficient to cover its book loss, when necessary to retire it, the loss is put in to the profit-and-loss account and is NOT carried over and charged against the replacement machine. (The new machine has nothing to do with bad bookkeeping.) If the trade-in price or cash selling price is higher than the book value, the difference is put into the profit-and-loss account. The book value is credited against the purchase of the new machine in capital account. The book value of the new machine is set up as a new figure equal to its total cost, and depreciation is based on the class into which it is put.

6. When replacement transaction involves the trading in of an obsolete machine, the buyer of the new machine should not attach more importance to the allowance that he can get for the old machine than to the importance of selecting the best machine for his needs, regardless of the allowance for the old machine.

Finally, the purchase of new equipment is justified when it can be shown that it will produce at a profit after it has met the conditions outlined.

In addition to lower production costs there are these advantages:

1. Prestige among employes and customers
2. Lower maintenance cost
3. Better product
4. Smaller losses in inspection
5. Employes' safety
6. Better mental attitude of men
7. Better choice of help

These factors alone might justify the occasional purchase of new equipment.

See on page 153 the list of prizes and trophies to be awarded at the Annual Dinner

REVIEWS

Direction des Entreprises Industrielles (Management of Industrial Enterprises). By Christo Casacof, Dunod, 92 Rue Bonaparte, Paris, France, 1936, pages vi, 76, 5 charts and tables.

The opening chapters treat of the initial basic fact upon which efficient organization must be preconceived before its entire functions can be deputized. The real problem appears to the writer as a "human factor" described by M. Dubreuil as being created by "the relation of men with men rather than a relation of men with technical knowledge."

Mr. Casacof deplores the fact that very few industrial leaders take the trouble to study human nature, the understanding thereof being so eminently necessary in the intelligent selection of two groups of men: one to direct, and the other capable of executing orders with perfect co-ordination, concurrent with the application of certain management principles and equally respected by the heads of the organization as by the subordinates.

Self-control, being one of the best qualities of a leader, should manifest itself by the equitable treatment of the personnel, derived from tactful observation of the capacity of those composing the productive centers; establishing a coefficient to each one's aptitude, thereby embracing the technique of a methodical management. Emphasis is placed upon the necessity of superiors giving orders in such a manner as will create the most intelligent results.

In brief the doctrine and the principles of efficient administration as suggested by Fayol is summed up in five distinct functions: foresight, organization, command, co-ordination and control.

The sections following the opening statements of this work

deal briefly with the origin of the scientific organization of labor, tracing its earliest rudiments to the seventeenth century and eulogizing Frederick W. Taylor whose working principles have been applied to industries in France with considerable impetus, more especially in later years.

Reviewing briefly the Taylor system, the writer offers a rapprochement of ideas between Fayol's doctrine and Taylor's conception of industrial organization, each plan constituting itself into a mechanism evolving a proper and rational method of management for any enterprise.

A subsequent chapter is devoted to the examplification of Emerson's twelve principles of efficiency, followed by a "motion study."

Finally, a very short summary upon "budgetary control" (defined by Mr. Casacof as the comparison of "figures that should exist with others non-existing") gives to that function the importance of a dominant character, which in its application becomes the safety valve necessary for the well-being of any enterprise. By G. R. CHASSEVENT, Industrial Engineer and International Business Counsel, New York.

The Professional Engineer. By Esther Lucile Brown, Russell Sage Foundation, New York, 1936, pages 86. ($.75.)

This recent publication of the Russell Sage Foundation contains some findings and statements of considerable interest to teachers and students of management. The author, Esther Lucile Brown, recognizes and emphasizes the need and importance of special training for engineers, who, in practicing their respective professions, concern themselves primarily with the administrative direction of technical enterprises. Engineers, she says, are to be found in growing numbers in these managerial positions, and for this work they need preparation, particularly in economics and the social sciences.

The author has concluded from her studies with respect to salaries being earned by engineers, that unless the engineer has combined with his technical skill "a generous degree of capacity to deal with men and affairs" his chances of earning a high salary have been greatly reduced. Her studies showed further that "not only was he likely to fail to attain the highest positions, which were almost invariably those of a managerial nature, but after the age of twenty-five he found himself in the distinctly lower-paid types of work."

A table compiled by the author shows that in 1930, mechanical engineers in the managerial work of technical operation received five hundred dollars more than those in non-managerial positions at thirty years of age, and one thousand, two hundred dollars more at sixty. Similarly, mechanical engineers engaged in the managerial aspects of research and design, received four hundred dollars and seven hundred dollars more per year at ages thirty and sixty than did non-managers.

In discussing the trends of the engineering profession, the author has concluded that the opportunities of the future for engineers lie in planning and administration. She says, "And as the technical aspects of methods of modern production become more important, the men who will be best fitted for executive positions will be graduates of technical schools." By PROFESSOR ASA S. KNOWLES, Head, Department of Industrial Engineering, Northeastern University, Boston.

Administrative Proficiency in Business. By Erwin H. Schell. McGraw-Hill Book Company, Inc., 1936, pages x, 292. ($2.50.)

In this volume Professor Schell adds another to the series of thoughtful, succinct and provocative essays on executive training which have been his distinctive contribution. The front pages neatly describe its origin, purpose and character in the following sentences: "It has been my good fortune and privilege to have intimate contact with many industrialists and to discuss with them their past experiences, present problems, and future aspirations. This book comprises the crystallization of much of this thinking over a long period of time. . . . It is written for business executives who are undertaking new responsibilities of an administrative nature—positions which call for the determination as well as the execution of policy and which incorporate supervision over major functions of the business, including the activities of other executives." The type of executive he has in mind is not only the men of tested executive ability who are already in important administrative posts, but also the younger business men who are carefully preparing themselves for future industrial positions of larger responsibility.

In content the book begins with the point of view that the new administrator should take towards his appointment, his predecessors and his new status. It then follows through in sequence to the various relations in which he finds himself under various circumstances. At many points there are original and arresting passages from which the executive may well profit. Merely as one instance:

"You must learn to be an easy listener. Your very title and position may keep from you facts that you should know. Rank is awesome to some people. Its emphasis may bring personal satisfaction, but the disadvantage will outweigh the pleasure. The existence of feelings, opinions, convictions, however wrong and misplaced, may be facts of great moment to you. Yet frequently they are not easy to discover. More than this, you should learn to listen to people with whom you disagree temperamentally. From a conflict of ideas something new and better may emerge." (page 61)

This is a book to buy, to mark up, to reflect upon, to make marginal notes on, to re-read from time to time. By HERMAN FELDMAN, Professor of Industrial Relations, The Amos Tuck School of Administration and Finance, Dartmouth College.

Collective Bargaining. By R. D. Bundy, National Foremen's Institute, Inc., New York and Chicago, 1937, pages 43. ($1.00.)

The value of a short and succinct treatment lies in its readability in these days of many issues and this book of forty-three pages on the immense subject of Collective Bargaining treats the "what" and "why" of the matter in clear and well-defined terms and even gives suggestions on "how."

This is a book for top executives to read and mark even

though the author puts the blame squarely on them for not recognizing sooner the need for collective bargaining, the lack of which recognition has resulted in the problem becoming an emotional one.

The need for an open mind on all sides is eloquently stressed and management is asked to agree that "The only way to insure that neither party to the bargain will take an unfair advantage of the other is to equalize the bargaining power."

Mr. Bundy, who has been in the positions of Foreman, Production Manager and Assistant Manager in a large industry and who is now Industrial Co-ordinator, Board of Education in Cleveland, recognizes the necessity for opening lines of communication between management and workers and skillfully outlines the importance of Foremen in the whole set-up. The need for proper selection of employes is also stressed.

Rating scales, standards, speed-up, and the workers' interpretation of them, are discussed to show how these can be friction points. Many of these difficulties can be overcome, however, by the selection and training of proper foremen for "The foreman occupies the diplomatic post of management and as such, is the moulder of worker opinion."

In conclusion the author states the problem as one of "developing procedures which will eliminate the causes of differences and build a better understanding upon a foundation of mutual confidence and respect" and calls upon the intelligence and proven ability of the American executive to apply his energies to the problem of human behavior, to recognize the rights of workmen to secure personal expression and adequate consideration. When management plays fair the question of industrial relations ceases to be a problem. By EVELYN BUCKLEY.

Social Security in the United States. By Paul H. Douglas. Whittlesey House, McGraw-Hill Book Company, Inc., 1936, pages xi, 384. ($3.00.)

Toward Social Security. By Eveline M. Burns, McGraw-Hill Book Company, Inc., New York, 1936, pages xii, 269. ($2.00.)

National Economic Security. By Arthur B. Adams. University of Oklahoma Press, Norman, Okla., 1936, pages 328. ($2.50.)

Both Miss Burns and Professor Douglas are outstanding students of the problems of social insurance and have had an intimate part in the activities leading toward the Social Security Act, but they are friendly critics of its inadequacies from a long time and national standpoint. Each contributes a volume intended for the general reader which is of first rate interest and value to one who wishes to get a thorough grasp of the fundamentals of the present movement for social insurance and, in particular, of the strength and weaknesses of the present Social Security Act. Since both belong to the progressive wing of the social security movement, their recommendations and criticisms will be regarded by most students as thoroughly sound and pointing in the right direction.

Professor Douglas' book covers wider ground in giving the background of the Act, in tracing the steps by which it came into being, and in the fuller information it provides about the laws passed by the States. Miss Burns' book, however, is notable in its concentration on essentials, its compactness and its emphasis on main issues. The two publications supplement each other in ways that no one would have expected of books issued independently for the same audience.

The insistent drive in Miss Burns' book is that of asking how much security the Act really provides and who, in fact, will pay for the amount already provided. Here she touches upon two of the live spots of the Act. As she points out, the attempt to make the Act self-sustaining to the extent of not having recourse to general taxes "compels the poorer members of society to pay for their own security," a principle which is sure to result either in inadequate or uncertain payments. She then traces through the incidence of the taxation and indicates where it should be located.

The Douglas book takes more account of the administrative problems which to many people are the vital ones in the immediate future of the whole program. It discusses more specifically the terms of unemployment insurance. Both books are strong in their analysis of the weaknesses of the tax offset scheme, of the Social Security Act and the superiority of the grant-and-aid principle in the establishment of national standards and more effective insurance.

Professor Adams' book is similar to the other two only in title. He hails from the wide-open spaces and he presents a full program for eliminating unemployment and maintaining permanent prosperity. The book starts out with the words, "Capitalism is not dead and should not die. The institutions of private property and individual initiative should be given ample opportunity to stimulate desirable productivity of our industrial system." This sentence would lead one to suspect some pretty stern economics, but instead we get a diffuse series of proposals.

The author starts by presenting an analysis of our break-down in terms largely of deficiency in consumer spending power and relative income, and then outlines a large number of policies which begin with the following:

1. Adjust the weekly work hours of laborers from time to time so that all employable laborers at all times would have jobs in private industry regardless of the physical volume of production at any particular time. . . . This, of course, will not be done voluntarily in each enterprise or even in each industry, but I see no insurmountable difficulty in the Federal government doing it for our industrial system as a whole.

2. Increase the percentage of the proceeds of the current net production of industry which goes to the industrial laborers by increasing the real wage rate per hour for each laborer. Adjust the total wage scales in industry from time to time, in accordance with changes in profits and in the volume of production. (page 93.)

"A Federal labor adjustment act should be passed to regulate hours and wages of laborers employed in industries engaged in interstate commerce. A Federal Labor Adjustment Board should enforce its provisions. The act should prohibit employment of laborers in such industries for more than thirty hours per week without specific permission from the Labor Adjustment Board." (page 203.)

The author could well have stopped there and followed through to demonstrate its economic validity so far. One would like to see how one may reduce hours, maintain or increase wages and also achieve the purpose so strongly expressed elsewhere of reducing prices. In these and a great many other matters, however, the writing skips over the rough spots, and the wisdom, economically and administratively, is not demonstrated. By HERMAN FELDMAN, Professor of Industrial Relations, The Amos Tuck School of Administration and Finance, Dartmouth College.

Le Contrôle Budgétaire (Budgetary Control). By Robert Satet, Delmas, 7 Rue de Madrid, Paris, France, 1936, pages xx, 282, 104 forms and charts, bibliography.

In the introduction of the above publication, Mr. Satet gives a quotation taken from Volume II, Book IX (Tsze Han), Chapter XVIII of Confucius' "Analects," the translation of which reads thus: "If you should each day deposit a basketful of earth at the same place, you will finally succeed in raising a mountain." Following this thought, he likens the student to whom the quotation was addressed to the credulous business men who raise all kinds of obstacles against the introduction of a budgetry method within their managements, while claiming advantageous results obtained by others in the application of the same method.

Whether in a small or large organization, a budgetary control should be successful if the basis is coupled with a firm desire to make it so, after having "sold" the idea to the personnel of the administration from which full collaboration must be obtained. "Once the application is made and experienced, no one will do without it."

A budgetary control must be established with a view to possessing information at all stages of production, not only of cost but of all business expenses and, in the aggregate, the sum total of outgo must be compared constantly with the receipts. To direct any enterprise financially, with the knowledge of its needs in capital, to allot these needs at the "optimum" time, constantly having under control all the centers of activity of all kinds, requires some detailed predeterminations which must be at the disposal of the management in order to facilitate its proper functions and to conform to the general policies of the administration. Of necessity all centers must contribute their respective shares to the formation of a budget which in turn reflects the soul of the enterprise.

The logical order advocated by Mr. Satet for its preparation is stated thus: sales, production, purchases, expenses, investment, finance and general. The merger of these individual plans results in the final program, which is revised periodically comparing the obtained results with the predetermined figures, thereby constituting a means, a tool of management rendering at any given moment, for each center or shop, a picture of its budgetary position and allowing, while there is sufficient opportunity, modifications of its plan of action, if necessary.

It implies, therefore, and requires a methodical organization, scientific and rational in all functions, to: (1) evaluate the predetermined cost; (2) bring to light the relation existing between expenses and receipts; (3) follow the movement of sales and, finally, (4) compare the predetermined figures with the actual results.

In the elaboration of the entire scheme of things, the sales budget becomes the master key of budgetary control, commanding the whole enterprise, since its object is to determine the volume of sales necessary to produce a normal profit. Emphasis is placed, therefore, upon its preparation by the use of statistical data, the salesmen's reports with reference to existing competition, and a study of the market.

From the sales budget, the monthly output being known, the program of production is prepared in the orderly sequence of each department, followed by the predetermined "optimum" use of the machinery, the level of the inventory of stock to be maintained and the control of the goods on hand. This budget of production is divided into four essential features: (a) determination of the periods of different classes of manufacturing, comprising the predetermination of the necessary lapse of time for each operation or series thereof; (b) the quantities to be produced according to seasons; (c) the preparation of the general program of production during each period, the cost of labor at each process of production, the whole being reduced to comprehensive charts, and (d) the maintenance of a level between the minimum and maximum of the possible and probable stock on hand.

The budget of "purchases" is naturally the resultant of the previous subject, production, but more especially dependent upon two principal factors: the capacity of the stores and warehouses, and the availability of funds. In addition thereto, the costs of raw material or of other factors influencing the market have to be considered in the formulation of contracts of purchase.

Expenses are presented briefly as comprising the cost of all sales services, the cost of production (material, labor and overhead) and purchases. In other words, it is the aggregate of the three preceding budgets merging into a whole which would be incomplete and unbalanced were the two subsequent elements, investments and capital, ignored.

By investments is meant the capital invested in all the machinery and equipment as well as the cost of improvements and maintenance, together with any additional cost in all forms related to the expansion of industrial functions. From the creation of this budget, the following deductions can be made: (1) are the machinery and equipment normal and sufficient? (2) are they too disproportionate for the contemplated production, or grossly inadequate to insure the desired result?

The comments offered on the subject of finance are predicated upon a study, made by M. E. Ludwig, of the factors influencing considerably the movement of the funds of an enterprise, which study was presented at the International Conference of Budgetary Control. These factors are, as follows: technique, stocks, investment, financial cost, financial policy, business index and the actual nature of the enterprise.

Finally, the co-ordination of all the material thus far prepared constitutes the General Budget containing all the necessary elements allowing the management to follow and control constantly, in a logical order, the progress of all centers of activity.

The necessary analysis of probable facts being thus com-

pletely established will permit a comparison of values with the recorded activities of each department, although it is pointed out that even with the greatest of care, the predetermined figures will not be strictly exact until after a certain time will have elapsed in the application of the main subjects enumerated in the preceding paragraphs.

However, it is believed that a Budgetary Control will create the most important of results appertaining to the welfare of any business, namely, the goodwill and spirit of collaboration between all the members of the administration and the enterprise as a whole, and the desire to obtain a collective benefit for all concerned.

The second part of "Budgetary Control" is concerned with its application within ten different countries. Reference is then made to the methods employed in France in the textile industry, metals and mechanical constructions, electricity and printing, and further amplified by several chapters dedicated to budgetary work in foreign countries with relation to metals, exports, heating apparatus, banks, clothing manufactures, shipping, newspapers, shoes, preserved goods and department stores, each of these applications being modified according to the needs of the respective industries.

The book is well written, full of data and forms, as well as valuable comments and information on other subjects. By G. R. CHASSEVENT, Industrial Engineer and International Business Counsel, New York, N. Y.

What is Ahead of Us? By G. D. H. Cole, Sir Arthur Salter, Wickham Steed, Sidney Webb, P. M. S. Blackett, Lancelot Hogben, The Macmillan Company, New York, 1937, pages 192. ($2.00)

Although written for an English audience, these Fabian Society lectures are important to us, both because of the international reputation of all of the lecturers and because of the timeliness of their several themes. They are all concerned with broad economic and international trends and all confront contemporary conditions with the tacit assumption that our basic economic system is in transition.

By far the most unusual and stimulating lecture is that of Professor Hogben whose "Mathematics for the Millions" is already familiar to American readers.

Indeed his discussion of the biological basis for human survival and the underlining planning required to assure an adequate biological basis represents an advanced type of scientific thinking in areas thus far all but ignored in this country. In fact, the volume would have been justified on the basis of the contribution to thought of this author alone. By ORDWAY TEAD, Editor of economic books, Harper & Brothers, New York.

How To Be a Good Foreman. By Charles Reitell, The Ronald Press Company, New York, 1937, pages vii, 186. ($1.50)

One day in 1929, while reviewing a course in economics with Charlie Reitell, I suggested that we might include more on the "law of diminishing returns." He replied, "There is no such law—it's just bad accounting."

Reitell looks at the work of the foreman through the eyes of an accountant, with the attitude of a fisherman. He believes that the foremen are the "finger-tips" of the "managerial arm." He conceives a good foreman as one who has acquired a mastery of the human elements, a grasp of the technical requirements, and a working knowledge of costs and budgetary control.

From the beginning foremen have grown with their jobs. Changing times now require new attitudes, new methods, and new relationships to successfully organize and manage a department of a modern organization. As a result, the new foreman has to be conditioned to his job. By clearly outlining the foreman's function in a modern organization, Reitell has provided a "field glass" for top management, a useful guide for the foreman, and a vocational beacon for ambitious young people who are looking for a way to serve the industrial age in which we live. By C. S. COLER, Industrial Relations, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Comment

(Continued from page 129)

the necessity of remaining work-fellows in our industrial relations. And magnanimity here is not merely an agreeable asset. It is an asset without which collaboration ceases.

Those who fight unions, even where unions seek to pick a fight, might well ask themselves if it is for principle or for power they are struggling. They might well count the costs of a prospective fight,—knowing that they are equally high whether they momentarily win or lose. They might then come to realize that not to fight is not cowardice. Not to fight is rather the adventuresome first step toward the creation of an attitude which (as the popular title goes) makes friends and influences people.

The Use of Factory Inspection Statistics

(Continued from page 142)

operator or inspector should actually measure a considerable number of pieces, say a hundred and see how many are near the center of the range and how many are near the engineering limits. When such a record is made at frequent intervals on the important parts of a machine, much valuable and surprising information will be obtained.

Annual Student Conference

Saturday, December 11, 1937

Hotel New Yorker

Papers by student members

Presentation of:

The Trundle Trophy

The R. I. Rees Award